گزارش حضور و شرکت در

اجلاس تخصصی کارشناسی برای توسعه زمینه اشتراک گذاری داده ها و تشریک دانش فنی برای عملیات مقرون به صرفه و نگهداری ایستگاههای زمینی ماهواره ای ملی

Expert Meeting for Development of Data sharing platform) and Technical Experience-sharing for Cost-effective Operation and Maintenance of National Satellite Earth (Stations

دوازدهم تا پانزدهم ژوئیه 2011
برابر با
بیست و یک تا بیست و چهار تیرماه 1390

مقر کمیته دائمی همکاری علمی فنی سازمان کنفرانس اسلامی
(COMSTECH)

اسلام آباد، پاکستان

پرویز تاریخی
سازمان فضایی ایران

گزارش حضور و شرکت در

اجلاس تخصصی کارشناسی برای توسعه زمینه اشتراک گذاری داده ها و تشریک دانش فنی برای عملیات مقرون به صرفه و نگهداری ایستگاههای زمینی ماهواره ای ملی

Expert Meeting for Development of Data sharing platform and) Technical Experience-sharing for Cost-effective Operation and (Maintenance of National Satellite Earth Stations

دوازدهم تا پانزدهم ژوئیه 2011- اسلام آباد، پاکستان

مقدمه

فناوری ماهواره ای امروزه نقش مهمی را در روند تحول و پیشرفت کشورها بازی می کند. هرچند دسترسی به خدمات ماهواره ای ارائه شده توسط ماهواره های تجاری و سازمانها و شرکتهای وابسته به آنها گزینه ای مناسب و پایدار برای بسیاری از ممالک است، اما تملک و به کار گرفتن ایستگاههای زمینی ماهواره ای (برای ماهواره های ارتباطاتی) و ایستگاههای زمینی (برای ماهواره های سنجس از دور) می تواند منافع فراوانی از حیث تامین داده های بموقع برای

کاربردهای بیشماری چون امداد بلایا، نظارت بر محصولات کشاورزی و کاربردهای دیگری که نیازمند بهنگام کردن مداوم تصاویر پدیده ها و همچنین افزایش خدمات پخش تلویزیونی و ارتباطات در سطح کشور هستند را به بارآورد.

بر این اساس شبکه بین الدول اسلامی در علوم و فناوری فضایی (Inter-Islamic Network on Space Sciences and Technology-ISNET)، کمیته دائمی همکاری علمی فنی سازمان کنفرانس اسلامی (OIC Standing Committee for Scientific and Technological Cooperation-COMSTECH) و سازمان فرهنگی، علمی و آموزشی اسلامی (Islamic Educational, Scientific and Cultural Organization-ISESCO) مشترکا **اجلاس تخصصی کارشناسی برای توسعه بستر اشتراک گذاری داده ها و تشریک دانش فنی برای عملیات مقرون به صرفه و نگهداری ایستگاههای زمینی ماهواره ای ملی** (Expert Meeting for Development of Data sharing platform and Technical Experience-sharing for Cost-effective Operation and Maintenance of National Satellite Earth Stations) را از دوازدهم تا پانزدهم ژوئیه 2011 برابر با بیست و یک تا بیست و چهار تیرماه 1390 در مقر کمیته دائمی همکاری علمی فنی سازمان کنفرانس اسلامی (COMSTECH) در اسلام آباد پاکستان برگزار کردند. اجلاس توسعه همکاری میان کشورهای عضو سازمان کنفرانس اسلامی در ارتباط با برنامه های مرتبط فضایی و اشتراک گذاری دانش فنی و ظرفیت سازی در عملیات ایستگاههای زمینی ماهواره ای را مد نظر داشت.

با توجه به اینکه بسیاری از ممالک عضو سازمان کنفرانس اسلامی فاقد ایستگاههای گیرنده زمینی می باشند، انجام پروژه های مشترک و به اشتراک گذاشتن داده ها می تواند راهی مؤثر برای توسعه و پیشرفت آنها باشد. این اجلاس به یافتن راهها و امکانات همکاری در اشتراک گذاری داده ها و نگهداری مقرون به صرفه و استفاده از تجهیزات موجود برای منافع متقابل کشورهای شرکت کننده توجه داشت.

اهداف اجلاس

اهداف کلی اجلاس عبارت از توسعه همکاری میان ممالک عضو سازمان کنفرانس اسلامی در ارتباط با برنامه های فضایی بود. برای نیل به این مقصود اجلاس اهداف مشروح زیر مد نظر داشت:

- آشنا کردن شرکت کنندگان با اخذ، پیش پردازش، پردازش و سیستم آرشیو داده ها و فناوری و خدمات پردازشهای با ارزش افزوده
- ایجاد بستری برای بحث امکان مشارکت و انجام پروژه های مشترک بین کشورهای عضو سازمان کنفرانس اسلامی
- فراهم کردن زمینه اشتراک گذاری دانش فنی در رابطه با مدیریت عملیاتی ایستگاههای گیرنده زمینی ماهواره ها برای کمک به شرکت کنندگان در رفع مشکلات و معضلات عملیاتی
- تعیین و فهرست کردن پروژه هایی که می توانند به طور مشترک توسط کشورهای عضو سازمان کنفرانس اسلامی در ارتباط با اشتراک گذاری داده ها و دانش فنی انجام گیرند
- تعیین زمینه های مساعدی که نیازمند ظرفیت سازی و توسعه است
- تعیین و معرفی رابطین برای فعالیتهای مشترک

قلمرو کاری اجلاس

حیطه کاری این اجلاس شامل مباحثه و تبادل نظر در زمینه معضلات عملیاتی و نگهداری تجهیزات و ایستگاههای گیرنده زمینی ماهواره ها، و یافتن راه حلهای مربوط به مشکلات عملیاتی ایستگاهها و فناوریهای پردازش داده ها می شد. همچنین طرحهای ارائه شده از سوی شرکت کنندگان در خصوص ترویج همکاری میان کشورهای شرکت کننده نیز مد نظر بود. اجلاس بر بحث در باره فعالیهای بخش زمینی ماهواره های سنجش از دور و ارتباطاتی شامل ارتباطات با ماهواره، تعیین مأموریت و کنترل ماهواره، انتقال داده های مسافت سنجی ماهواره، پردازش و آرشیو داده ها، عملیات تهیه نسخه پشتیبان، و رفع عیب در صورت بروز مشکلات عملیاتی تمرکز داشت.

موضوعات مشروح زیر مواردی بودند که اجلاس برای بحث و بررسی آنها برنامه ریزی کرده بود:

- اصول و عملیات اخذ داده های ماهواره ای
- نرم افزارهای پردازش و کاتالوگ پایگاه های داده ای چند ماهواره ای
- برنامه ریزی و تعیین مطلوترین مأموریت برای ماهواره
- روشهای تصحیحات هندسی
- آرشیو کردن و توزیع داده ها از طریق شبکه
- زیرساخت پایگاه داده ای مکانی (SDI) و ژئوپورتال
- مدل ارتفاعی رقومی، مدل زمینی و پرواز بر فراز پدیده مورد مطالعه
- معماری سیستم، طراحی و وجوه ارتباطی راه اندازی ایستگاههای گیرنده زمینی
- عملیات و نگهداری ایستگاههای زمینی ثابت و متحرک
- تحلیل اعتبار ارتباط
- کاربردها و خدمات ماهواره های سنجش از دور - استفاده بالقوه از داده های سنجش از دور برای نظارت بلایا، نقشه برداری و سایر کاربردهای موضوعی
- کاربردها و خدمات ماهواره های ارتباطاتی – ماهواره های ارتباطاتی برای آموزش از دور، پزشکی از دور و غیره
- مسافت سنجی باند S، ردیابی و کنترل (TT&C) ماهواره های مدار پایین LEO

برگزاری اجلاس

برنامه اجلاس شامل دوازده نشست بود که اولین آن نشست افتتاحیه و آخرین آن نشست اختتامیه بود. ده نشست میانی نیز به مباحث علمی و تخصصی تعیین شده در حیطه کاری اجلاس اختصاص داشتند. (برای جزئیات بیشتر بخش "الف" پیوستها را ببینید.) **روز اول** اجلاس با قرائت قرآن مجید آغاز شده و سپس آقایان دکتر محمدعلی ماهِسَر معاون رئیس کمیته دائمی همکاری علمی فنی سازمان کنفرانس اسلامی (کامستِک)، دکتر مختار احمد معاون مدیر کل سازمان فرهنگی، علمی و آموزشی اسلامی (ایسِسکو) و احمد بلال رئیس کمیسیون پژوهشی فضا و جو فوقانی پاکستان (Pakistan Space and Upper Atmosphere Research Commission-SUPERCO)- سوپارکو به ترتیب به ایراد بیانیه های افتتاحیه پرداختند. محور اصلی بیانیه های ارائه شده تاکید بر لزوم استفاده از توانمندیها و امکانات گسترده و متعدد موجود در حوزه ملل اسلامی در رابطه با علوم و فناوریهای مختلف و بخصوص علوم و فناوری فضایی داشت و ممالک اسلامی عضو سازمان کنفرانس اسلامی را به تشریک دانش، مهارتهای علمی و فنی و عملکرد یکپارچه و جهتمند در زمینه های علمی و فنی مرتبط با فضا فرا می خواندند. پس از اتمام مراسم افتتاحیه دومین نشست با موضوع "راه اندازی و استفاده از امکانات ایستگاههای زمینی ماهواره ای" (Operations & Utilization of Satellite Earth Stations- Capabilities) با ریاست جلسه آقای ارشد سراج، مدیر اجرایی شبکه بین الدول اسلامی در علوم و فناوری فضایی (ایزنت) آغاز شد که سخنران اول آن نگارنده (پرویز تاریخی) با مقاله ای تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی" (ISA's Data Sharing and Ground Receiving Station Developments) بود. متن و پاورپوئنت مقاله ارائه شده توسط نگارنده در بخش "ت" و "ث" پیوستها آمده است. سه سخنران دیگر از مالزی، پاکستان و سنگال به ارائه مقالاتی در ارتباط با موضوع نشست دوم پرداختند. پس از پایان هر سخنرانی پرسشهایی از سوی حاضران در جلسه مطرح شد که توسط سخنرانان پاسخهای مربوطه داده شد. با پایان نشست دوم برنامه روز اول نیز به اتمام رسید.

روز دوم اجلاس روزی پرکارتر و فشرده تراز روز قبل بود. در این روز چهار نشست تخصصی و علمی برگزار گردید. اولین نشست روز دوم که در واقع سومین نشست اجلاس نیز بود به موضوع "راه اندازی ایستگاههای زمینی ماهواره ای" (Satellite Ground Station Operation) می پرداخت که در آن چهار مقاله از سوی متخصصان پاکستانی که عمدتا از کمیسیون پژوهشی فضا و جو فوقانی پاکستان (سوپارکو) بودند ارائه گردید و ریاست جلسه را آقای مزلان بن اسماعیل از سازمان فضایی مالزی بر عهده داشت. نشست چهارم اجلاس به ریاست نگارنده در موضوع "طرز کار و خدمات ماهواره های ارتباطاتی" (Communication Satellite Services and Practice) برگزار گردید که در آن دو سخنران از پاکستان مقاله ارائه دادند که موضوع مقالات آنها به ترتیب به خدمات ماهواره پاکستانی پاکست-یک و مطلوب سازی

خدمات VSAT بود. نشست پنجم اجلاس عنوان "بخشهایی فضایی و زمینی ماهواره" (Satellite Ground and Space Segments) را داشت که این نشست نیز به ریاست نگارنده برگزار شد و در آن تنها یک سخنرانی در باره ایستگاه کنترل زمینی ماهواره پاکست-یک پاکستان توسط کارشناس مربوطه از سازمان سوپارکو ارائه گردید. ششمین نشست اجلاس به موضوع "راه اندازی و نگهداری ایستگاههای زمینی" (Satellite Ground Operations & Maintenance) پرداخت و ریاست آن را آقای رحیم صنیع الله از سازمان سوپارکوی پاکستان عهده دار بود که در طی آن پنج مقاله ارائه گردید و یکی از آنها مربوط به یکی از اعضای هیئت ایرانی، آقای کمال یزدانی ارجمند از مرکز فضایی البرز (مرکز فضایی ماهدشت) تحت عنوان "روشهای ردیابی ماهواره های سنجش از دور" (Tracking Methods of Remote Sensing Satellites) بود.

روز سوم اجلاس با نشست هفتم آغاز شد که در آن دو مقاله در رابطه با ایستگاههای گیرنده زمینی ماهواره ای سازمان ملی مصر برای علوم سنجش از دور و فضا و ایستگاه گیرنده زمینی ماهواره ای پاکستان به ترتیب توسط نمایندگان مصر و پاکستان ارائه شد. پس از آن نوبت به برگزاری نشستهای هشتم، نهم و دهم که در واقع به ترتیب مربوط به نشستهای تخصصی سه گروه کاری "راه اندازی و نگهداری ایستگاههای زمینی ماهواره ای" (Working Group on Operations and Maintenance of Satellite Ground Stations)، "اشتراک گذاری داده ها" (Working Group on Data Sharing) و "اشتراک گذاری دانش/تجربه فنی" (Working Group on Technical Expertise/Experience Sharing)/ بودند رسید. هر سه عضو هیئت ایرانی در هر سه این گروههای کاری حاضر و در این نشستها به ارائه نقطه نظرات و پیشنهادات لازم پرداختند.

در بعد از ظهر روز سوم اجلاس بازدیدی از ایستگاه گیرنده زمینی ماهواره ای پاکستان برای شرکت کنندگان اجلاس تدارک دیده شده بود. این ایستگاه که زیر نظر کمیسیون پژوهشی فضا و جو فوقانی پاکستان (سوپارکو) اداره می شود در فاصله چهل کیلومتری اسلام آباد مستقر است و در حال حاضر فعالیتهای اخذ و پردازش و ذخیره سازی داده ها از ماهواره هایی که مهمترین آنها اسپات فرانسوی با توان تفکیک بالا می باشد در آنجا در جریان است. در کنار فعالیتهای اخذ و پردازش و ذخیره سازی داده ها پروژه های پژوهشی و توسعه ای مختلف نیز در آنجا در حال انجام می باشد. گذشته از ایستگاه گیرنده زمینی ماهواره ای پاکستان شرکت کنندگان اجلاس بازدیدی هم از انستیتوی فناوری فضایی که در جوار ایستگاه گیرنده زمینی ماهواره ای پاکستان واقع است به عمل آوردند. این انستیتو در دو زمینه آموزش و پژوهش فناوری فضایی (در عمل هوافضا) مشغول به کار است و حدود پانصد دانشجو در مقطع لیسانس و فوق لیسانس در رشته های مختلف مهندسی مربوط به هوافضا در آن مشغول به تحصیل می باشند تا بتوانند نیازهای تخصصی و مهندسی کشور پاکستان در حوزه هوافضا را پاسخگو باشند. این انستیتو در واقع زمانی زیر نظر سوپارکو بود ولی در حال حاضر منفک از آن به عنوان نهادی آموزشی و تحقیقاتی زیر نظر وزارت علوم پاکستان کار می کند.

روز چهارم یا روز پایانی اجلاس با برگزاری دو نشست پازدهم و اختتامیه همراه بود. نشست یازدهم به موضوع تعیین پروژه های مشترک بالقوه و زمینه های ظرفیت سازی و همچنین فرصتها/دانش فنی موجود در حوزه کشورهای عضو کنفرانس اسلامی پرداخت و سپس در نشست اختتامیه توصیه های شرکت کنندگان اجلاس که در روز سوم اجلاس مورد بحث و بررسی شرکت کنندگان قرار گرفته بود نهایی شد و همچنین توصیه های ارائه شده توسط ایزنت نیز به بحث گذاشته شده و نهایی گردید. ایران نقش موثری در ارائه نظر و بحث در باره توصیه های شرکت کنندگان اجلاس و توصیه های ارائه شده توسط ایزنت داشت. (برای جزئیات بیشتر بخشهای "ب" و "پ" پیوستها را ببینید.) نشست اختتامیه با حضور نمایندگان کمیته دائمی همکاری علمی فنی سازمان کنفرانس اسلامی (کامستِک)، سازمان فرهنگی، علمی و آموزشی اسلامی (ایسِسکو) و شبکه بین الدول اسلامی در علوم و فناوری فضایی (ایزنت) و شرکت کنندگان پاکستانی و بین المللی اجلاس ادامه یافت و در پایان نگارنده از سوی شرکت کنندگان بین المللی اجلاس مراتب سپاسگزاری و تشکر از برگزار کنندگان اجلاس را به اطلاع آنان رساند.

شرکت کنندگان اجلاس

شرکت کنندگان اجلاس متشکل از متخصصان و کارشناسان علوم و فناوری فضایی از کشورهای جمهوری اسلامی ایران، مالزی، سنگال و مصر، و کمیسیون پژوهشی فضا و جو فوقانی پاکستان (سوپارکو) و همچنین سایر سازمانها و مراکز مرتبط با کار برد علوم و فناوری فضایی در پاکستان بودند.

هیئت ایرانی شامل آقایان حسن بیدار، کمال یزدانی ارجمند و نگارنده (پرویز تاریخی) از سازمان فضایی ایران بودند.

برنامه های حاشیه ای اجلاس

- شرکت کنندگان بین المللی اجلاس و بخشی از کارشناسان و مدیران ارشد کمیسیون پژوهشی فضا و جو فوقانی پاکستان (سوپارکو) و کارکنان و مسئولان ایزنت شامگاه روز اول اجلاس در ضیافت شامی که در محل هتل ماریوت اسلام آباد به میزبانی و پذیرایی گرم و دوستانه آقای احمد بلال، رئیس کمیسیون پژوهشی فضا و جو فوقانی پاکستان (سوپارکو) ترتیب یافته بود شرکت کردند. آقای بلال در مراسم شام بر لزوم همکاری و تشریک مساعی کشورهای عضو ایزنت در انجام فعالیتهای مربوط به علوم و فناوری فضایی و انجام پروژه های مشترک مرتبط تاکید کردند.
- شرکت کنندگان بین المللی اجلاس به همراه مسئولان ایزنت به بازدید از بازار و مرکز تجاری شهر اسلام آباد در عصر روز دوم اجلاس پرداختند.
- عصر روز سوم اجلاس شرکت کنندگان بین المللی اجلاس به همراه مسئولان ایزنت به بازدید از موزه یادواره پاکستان پرداختند. در این موزه افتخارات و سوابق ملی و فرهنگی و علمی کشور پاکستان از چند هزارسال پیش به این سو به نمایش گذاشته شده بود، و بر تاریخ معاصر کشور که تشکیل آن از لحاظ سیاسی به دو سال پس از

پایان جنگ جهانی دوم برمی گردد و بنیانگذار آن محمد علی جناح تاکید ویژه ای شده بود. پس از بازدید از موزه ضیافت شامی توسط آقای ارشد سراج، مدیر اجرایی شبکه بین الدول اسلامی در علوم و فناوری فضایی (ایزنت) در یکی از مناطق ییلاقی و کوهستانی شمال اسلام آباد برای شرکت کنندگان بین المللی اجلاس ترتیب داده شده بود. وجود معابد بودایی و اسلامی در کنار همدیگر در این منطقه تفریحی و استراحتی جالب توجه بود.

- ❖ کلیه شرکت کنندگان بین المللی و تعدادی از شرکت کنندگان پاکستانی و همچنین بخشی از مسئولان برگزار کننده اجلاس در ظهر روز جمعه چهارمین روز اجلاس که روز پایانی آن نیز بود در مسجد فیصل اسلام آباد برای ادای نماز جمعه حاضر شدند.
- ❖ شرکت کنندگان بین المللی اجلاس به همراه مسئولان ایزنت عصر روز چهارم اجلاس به گردش و بازدید از پارک ملی کوهستان مارگالا در شمال شهر اسلام آباد پرداختند. پس از بازدید از پارک ملی شرکت کنندگان بین المللی و مسئولان ایزنت در ضیافت شامی که توسط آقای ارشد سراج، مدیر اجرایی شبکه بین الدول اسلامی در علوم و فناوری فضایی (ایزنت) در رستوران مونال واقع در مرتفعترین مکان پارک ملی کوهستان مارگالا ترتیب داده شده بود حضور یافتند. از این مکان شهر یک میلیون و دویست هزار نفری اسلام آباد منظره ای بی نظیر و بسیار زیبا داشت.

نتایج و توافقات به عمل آمده در اجلاس، دستاوردهای هیئت ایرانی و پیشنهادها

- در پایان اجلاس ایزنت اعلام نمود چنانچه یکی از کشور های عضو سازمان کنفرانس اسلامی قصد تاسیس ایستگاه گیرنده زمینی ماهواره ای در کشور خود را داشته باشد، در صورت در خواست آن کشور ایزنت مکلف به هماهنگی مساعدتها و پشتیبانی سایر کشورهای عضو ایزنت به کشور مورد نظر است.
- مقرر گردید تا ایزنت اجلاسهای مربوط به ایستگاههای گیرنده زمینی ماهواره ای را هر دو سال یک بار در یکی از کشورهای عضو برگزار کند. پیشنهاد می گردد تا سازمان فضایی ایران میزبان برگزاری اجلاس بعدی در این رابطه باشد. برای این منظور لازم است تا ترتیبات اداری و پروتکلی لازم توسط مسئولان محترم سازمان فضایی ایران معمول گردد.
- ایزنت مکلف شد به تدارک و برگزاری دوره های آموزشی کوتاه مدت در زمینه های مختلف مربوط به ایستگاههای گیرنده زمینی ماهواره ای اقدام نموده و سازوکارهایی را برای تشریک داده ها و دانش فنی و تجارب در این زمینه ایجاد نماید.
- شرکت کنندگان اجلاس با موضوع تشریک داده ها و دانش فنی در راه اندازی، نگهداری و مدیریت ایستگاههای گیرنده زمینی کشور متبوع خود موافقت کردند.
- کلیه شرکت کنندگان اجلاس بر این باور بودند که حتی المقدور تشریک داده ها در میان کشورهای عضو ایزنت فراهم و برقرار گردد. آنان موافق بودند که ایزنت منشوری (چارتر) را برای تشریک داده های سنجش از دور ایجاد کند تا در صورت ضرورت و وقوع بلایا در هر یک از کشورهای عضو ایزنت در دسترس نهادها و مسئولان مربوطه قرار بگیرد. لازم به توضیح است که چنین منشوری در حال حاضر توسط دفتر امور فضای ماورای جو سازمان ملل متحد در وین اتریش از قریب به یک دهه پیش برقرار شده است که نتایج و دستاوردهای مفید و قابل توجهی داشته است. نهادها و سازمانهای بین المللی و منطقه ای دیگری نیز دست به چنین ابتکارهایی زده اند که فعالیتی موفق و موثر بوده است. اقدام ایزنت در ایجاد چنین منشوری می تواند برای ممالک عضو سازمان کنفرانس اسلامی اقدامی سازنده و مناسب از لحاظ آمادگی در برابر وقوع بلایای متعدد طبیعی و غیر طبیعی و کاهش اثرات آنها و در نهایت توسعه پایدار و رفاه هرچه بهتر و بیشتر ملل اسلامی باشد.
- با توجه به اینکه منطقه پوشش ایستگاههای گیرنده ایران و پاکستان همپوشانی فراوانی دارند پیشنهاد گردید تا تمهیداتی برای تبادل داده های دریافتی جدید و همچنین داده های آرشیو شده توسط هرکدام از ایستگاههای گیرنده اندیشده شود. پاکستان دارای داده های ماهواره های لندست چهار و پنج امریکایی از سال 1989 تا سال 1998 و داده های ماهواره اسپات فرانسوی از سال 1992 تا کنون است. ایران نیز دارای داده های آرشیو شده لندست از سالهای بسیار دور در آرشیو داده هایش می باشد. هر دو کشور ابراز علاقه کردند که از دادهای آرشیو شده همدیگر با رعایت پروتکلها و مقررات اداری دو کشور در جهت انجام پروژه های مشترک استفاده کنند. ایران

علاقه خود را برای دسترسی به داده های با توان تفکیک بالای ماهواره اسپات که در آرشیو داده های طرف پاکستانی موجود و در دسترس می باشد اعلام نمود.

- در ارتباط با نصب و راه اندازی و کنترل ایستگاههای گیرنده زمینی ایران تمایل خود را به بهره گیری از مساعدتها، تجارب و آموزش از جانب سوپارکو در رابطه با موارد مذکور اعلام نمود.
- مصر و ایران مشترکا تمایل خود را برای برخورداری از پشتیبانی و حمایت پاکستان در ارتقا ایستگاه گیرنده زمینی باند ایکس کشور خود در چارچوب تشریک داده ها و دانش فنی میان کشورهای عضو ایزنت ابراز نمودند.
- نماینده کشور سنگال تمایل کشور متبوع خود را برای بهره گیری از مساعدت هر کدام از کشورهای عضو ایزنت در ارتقاء ایستگاه گیرنده زمینی ماهواره ای خود اعلام نمود. ایران می تواند در این خصوص مساعدتهای لازم را در اختیار کشور سنگال قرار دهد. با توجه به اینکه طبق گفته نماینده کشور سنگال در اجلاس مبادلات علمی و فنی مطلوبی بین ایران و سنگال وجود دارد سوق دادن مناسبات به سمت تبادل داده و دانش فنی در خصوص فناوریهای فضایی بخصوص سنجش از دور فرصت مغتنمی برای ایران خواهد بود.
- کشور مالزی دارای امکانات خوبی برای آموزش دانش فنی مربوط به ایستگاههای گیرنده زمینی ماهواره های مدار پایین (LEO) و همچنین انجام تستهای مداری و ماموریتی این نوع ماهواره ها می باشد و متمایل به تشریک این امکانات و توانمندیها با کشورهای عضو ایزنت است. این کشور دارای تجارب مفیدی در طراحی، ساخت و آزمایش ماهواره های سنجش از دور می باشد. این کشور همچنین آمادگی دارد تا در ارتباط با آموزش مهندسی سیستمهای ارتباطات ماهواره ای در مقطع لیسانس و فوق لیسانس و هچنین مقطع دکترای سجش از دور و سیستمهای اطلاعات جغرافیایی در دانشگاه ملی فناوری مالزی زمینه ها و امکانات لازم را برای کشورهای عضو ایزنت فراهم آورد.
- نماینده کشور مصر اعلام نمود که کشور متبوعش دارای دانش فنی در طراحی و ساخت برخی سیستمهای ارتباطاتی، کار بر روی سیستمهای GPS و پروتکلهای ارتباطاتی است و آمادگی دارد تا آن را با سایر کشورهای عضو ایزنت به اشتراک بگذارد. این کشور همچنین آمادگی آموزش و تعلیم کار و استفاده از تابشسنج ابرطیفی را به کارشناسان و متخصصان کشورهای عضو ایزنت دارد.
- کلیه شرکت کنندگان اجلاس تمایل خود را در به کارگیری از فناوریهای سنجش از دور و GIS در کاربردهای کشاورزی و مدیریت و کاهش اثر بلایا در میان کشورهای عضو ایزنت ابراز نمودند.
- هیئت ایرانی علاقه مندی کشور متبوع خود را در بهره گیری از دانش فنی سوپارکو در زمینه کشاورزی، بلایا، مطالعات کاربری اراضی و محیط زیست و هیدرولوژی در قالب انجام پروژه های دوجانبه و مشترک اعلام نمود.

پیوستها

الف- برنامه و دستور کار اجلاس

ب- توصیه های گروه های کاری تشکیل شده در طی اجلاس

پ- توصیه های شبکه بین الدول اسلامی در علوم و فناوری فضایی

ت- متن مقاله ارائه شده توسط نگارنده تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی" (ISA's Data Sharing and Ground Receiving Station Developments)

ث- پاورپوئنت مقاله ارائه شده توسط نگارنده تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی" (ISA's Data Sharing and Ground Receiving Station Developments)

ج- پاورپوئنت مقاله ارائه شده توسط عضو هیئت ایرانی آقای کمال یزدانی ارجمند تحت عنوان "روشهای ردیابی ماهواره های سنجش از دور" (Tracking Methods of Remote Sensing Satellites)

پیوستها

الف- برنامه و دستور کار اجلاس

ب- توصیه های گروه های کاری تشکیل شده در طی اجلاس

پ- توصیه های شبکه بین الدول اسلامی در علوم و فناوری فضایی

ت- متن مقاله ارائه شده توسط نگارنده تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی" (ISA's Data Sharing and Ground Receiving Station Developments)

ث- پاورپوئنت مقاله ارائه شده توسط نگارنده تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی" (ISA's Data Sharing and Ground Receiving Station Developments)

ج- پاورپوئنت مقاله ارائه شده توسط عضو هیئت ایرانی آقای کمال یزدانی ارجمند تحت عنوان "روشهای ردیابی ماهواره های سنجش از دور" (Tracking Methods of Remote Sensing Satellites)

الف- برنامه و دستور کار اجلاس

Expert Meeting for Development of Data Sharing Platform and Technical Experience-sharing for Cost-effective Operation & Maintenance of National Satellite Earth Stations

12 – 15 July 2011, Islamabad, Pakistan

PROGRAMME

DAY 1

TUESDAY, 12 July 2011

Inaugural Session

0915 hrs	:	Guests to be seated
0930 hrs	:	Recitation from Holy Quran
0935 hrs	:	Welcome Address by Dr Mohammad Ali Mahesar Assistant Coordinator General COMSTECH
0945 hrs	:	Address by Dr Mukhtar Ahmed Deputy Director General, ISESCO
1000 hrs	:	Inaugural Address by Chief Guest Mr Ahmed Bilal Chairman SUPARCO
1015 hrs	:	**Refreshments**

Session II
Operations & Utilization of Satellite Earth Stations – Capabilities

Chairman	:	Mr Arshad Siraj
Co-Chairman	:	Mr Kamal Yazdani Arjmand
Rapporteur	:	Ms Aisha Naseer
1130 – 1150 hrs	:	ISA's Data Sharing and Ground Receiving Station Developments By Dr Parviz Tarikhi, Iranian Space Agency (ISA) Iran
1150 - 1210 hrs	:	Country Paper, Malaysia By Maszlan Bin Ismail, National Space Agency (ANGKASA), Malaysia

1210 - 1230 hrs	:	PAKSAT and PAKSAT 1R - Services and Applications By Mohammad Latif, Paksat International Ltd
1230 - 1250 hrs	:	Receiving Station and Image Processing at Centre de Suivi Ecologique (CSE) By Ousmane BOCOUM, CSE, Senegal
1300	**:**	**Lunch / Prayers**

Day 1 Ends

DAY 2

WEDNESDAY, 13 July 2011

Session-III

(Satellite Ground Station Operation)

Chairman	:	Mr Maszlan Bin Ismail
Co-Chairman	:	Mr Hassan Bidar
Rapporteur	:	Mr Imran Akhtar Shah
0900 – 0925 hrs	:	SGS Overview – Systems & Activities By Muhammad Khalid Khan, SUPARCO, Pakistan
0925 – 0930 hrs	:	Q/A Session + transition for the next presentation
0930 – 0945 hrs	:	SGS Principles & Practices By Muhammad Zaeem Hasan, SUPARCO, Pakistan
0945 – 0950 hrs	:	Q/A Session
0950 - 1000 hrs	:	Maintainability of Satellite Ground Station By Ahmed Ali Gul, SUPARCO, Pakistan
1000 – 1005 hrs	:	Q/A Session + transition for the next presentation
1005 – 1020 hrs	:	Technical Presentation on Atmospheric Data Receiving Station (ADRPC) By Aisha Naseer, SUPARCO, Pakistan
1020 – 1025 hrs	:	Q/A Session + transition for the next presentation
1025 – 1110 hrs	**:**	**Tea / Coffee Break**

Session-IV

(Communication Satellite Services and Practices)

Chairman	:	Dr Parviz Tarikhi
Co-Chairman	:	Dr Essam A Eldiwany (missing)
Rapporteur	:	Mr Kamal Yazdani Arjmand

1115 – 1135 hrs	:	The Trends of DTH Broadcasting Services Inclusive of Media Processing Center – Commercial importance for Pakistan and opportunity for PAKSAT-1R By Imran Akhtar Shah, Pakistan
1135 – 1140 hrs	:	Q/A Session + transition for the next presentation
1140 – 1200 hrs	:	Optimization of VSAT Service Provision Processes Using Engineering Management Audit By Imran Maqsood, Pak Datacom Ltd
1200 – 1205 hrs	:	Q/A Session

Session-V

(Satellite Ground and Space Segments)

Chairman	:	Dr. Parviz Tarikhi
Co-Chairman	:	Mr Ousmane Bocoum
Rapporteur	:	Mr Muhammad Khalid Khan
1205 – 1225 hrs	:	An overview of Paksat-1R Ground Control Station By Raheem Sanaullah, SUPARCO, Pakistan
1225 – 1230 hrs	:	Q/A Session + transition for the next presentation
1300 – 1400 hrs	**:**	**Lunch / Prayer break**

Session-VI

(Satellite Ground Operations & Maintenance)

Chairman	:	Mr Raheem Sanaullah
Co-Chairman	:	Mr Maszlan Bin Ismail
Rapporteur	:	Mr Imran Akhtar Shah
1415 – 1430 hrs	:	International COSPAS-SARSAT Satellite Aided Search & Rescue program By Ramiza Siddiqui, SUPARCO, Pakistan
1430 – 1435 hrs	:	Q/A Session + transition for the next presentation
1435 – 1450 hrs	:	Satellite Programming Management By Yousaf Ali, SUPARCO, Pakistan

1450 – 1455 hrs	:	Q/A Session + transition for the next presentation
1455 – 1510 hrs	:	Tracking Methods of Remote Sensing Satellites By Kamal Yazdani Arjmand Iranian Space Agency (ISA) Iran
1510 – 1515 hrs	:	Q/A Session
1515 – 1530 hrs	**:**	**Tea / Coffee Break**
1530 – 1545 hrs	:	TS5 Processing System By Asmat Ullah, SUPARCO, Pakistan
1545 – 1550 hrs	:	Q/A Session + transition for the next presentation
1550 – 1605 hrs	:	S-band. Telemetry, Tracking and Command (TT&C) of Low Earth Orbit Satellites By Hasan Mehdi, SUPARCO, Pakistan
1605 – 1610 hrs	:	Q/A Session

DAY 2 ENDS

DAY 3

THURSDAY, 14 July 2011

Session-VII

0900 – 0925 hrs	:	Satellite Ground Control Station – Technology & Operations By Dr. Matar Ali Matar Electronics Research Institute, National Authority for Remote Sensing and Space Sciences (NARSS), Egypt
0925 – 0930 hrs	:	Q/A Session + transition for the next presentation
0930 – 0945 hrs	:	SGS, Islamabad collaborative projects and data sharing By Muhammad Khalid Khan, SUPARCO, Pakistan

Sessions VIII-X

Meetings of Working Groups

Working Group on Operations and Maintenance of Satellite Ground Stations

Working Group on Data sharing

Working Group on Technical expertise/experience sharing

1030 – 1100 hrs : Tea / Coffee Break

Reporting of the discussions and observations of the working groups
Identification of potential areas of collaboration

1300 – 1400 hrs : Lunch / Prayer break

At 1400 hrs

Departure for a visit to SUPARCO Satellite Ground Station (SGS), Islamabad
Institute of Space Technology (IST)

DAY 3 ENDS

DAY 4

FRIDAY, 15 July 2011

Session-XI

0900 – 0930 hrs	:	Identifying potential joint projects and capacity building areas as well as opportunities / expertise available in OIC countries to Human resource development in these areas
0930 – 1000 hrs	:	**Feedback / Recommendation by participants**
1000 – 1100 hrs	**:**	**Refreshments**

Session-XII

Closing Session

1100 – 1130 hrs	:	Final Recommendations of all Working groups
1130 – 1140 hrs	:	Signatures on recommendations of Working Groups
1140 – 1150 hrs	:	Note of thanks
1150 – 1200 hrs	:	Distribution of Meeting Documents/ Recommandations/ CDs, etc.

Group photo sessions

Lunch

Jumah Prayers at Faisal Masjid

End of event

ب- توصیه های گروه های کاری تشکیل شده در طی اجلاس

WORKING GROUP No 1: OPERATIONAL MANAGEMENT OF SATELLITE EARTH STATIONS

Scope:

Sharing of knowledge on:

- Remote Sensing Satellite Ground Station, Islamabad
- Atmospheric Data Receiving & Processing Satellite Ground Station, Karachi
- PAKSAT-1R Satellite Ground Station, Lahore and Karachi
- COSPAS-SARSAT Ground Receiving Station, Karachi
- Satellite earth stations of other ISNET member countries

Participants:

1. Abdul Wasiu Mahar, Pakistan
2. Ahmad Ali Gul, Pakistan
3. Aisha Naseer, Pakistan
4. Asmat Ullah, Pakistan
5. Essam Eldiwany, Egypt
6. Hasan Bidar, Iran
7. Ibrar ul Hasan Akhtar, Pakistan
8. Ijaz Ahmad, Pakistan
9. Kamal Yazdani Arjmand, Iran
10. Maszlan Bin Ismail, Malaysia
11. Muhammad Khalid Khan, Pakistan
12. Muhammad Zaeem Hasan, Pakistan
13. Ousmane Bocoum, Senegal
14. Parviz Tarikhi, Iran
15. Rameeza Siddiqui, Pakistan
16. Yousaf Ali, Pakistan

Recommendations:

1. Participants agreed to share knowledge and expertise in the opreation, maintenance and management of ground receiving stations of their respective countries. The presentations made in the seminar will be provided to all the participants on DVD.
2. Participants agreed to provide more information about their earth stations.

Initial Focal Point:

Pakistan:	Aisha Naseer
Egypt:	Essam Eldiwany
	+2-02-26251226
Iran:	Kamal Yazdani
	+982613269018, yazdani@isa.ir
Senegal:	Malick Diagne
	+221-338258066, malick.digne@sce.sn
Malaysia:	Maszlan Bin Ismail
	+603-3180-4377, maszlan@angkasa.gov.my Egypt:
	Matar Ali matar
	+2-02-26251226, alimatar49@gmail.com
Pakistan:	Muhammad Khalid Khan
	0092-51-9273314, sgs@suparco.net.pk
Pakistan:	Raheem Sanaullah
Pakistan:	Rameeza Siddiqui

WORKING GROUP No 2: DATA AND EXPERTISE SHARING OF REMOTE SENSING GROUND STATION

Scope:

Identification of viable projects that could be under taken jointly:

- Data sharing
- Direct acquisition zone (OIC countries covered)
- Direct acquisition zone (area sharing)
- Direct acquisition zone (time sharing-historical data)
- Data analysis (satellite, area, time period, resolution, countries)
- Near future programs
- Mutual cost effective sharing analysis

Participants:

1. Abdul Wasiu Mahar, Pakistan
2. Ahmad Ali Gul, Pakistan
3. Aisha Naseer, Pakistan
4. Asmat Ullah, Pakistan
5. Essam Eldiwany, Egypt
6. Hasan Bidar, Iran
7. Ibrar ul Hasan Akhtar, Pakistan
8. Ijaz Ahmad, Pakistan
9. Kamal Yazdani Arjmand, Iran
10. Maszlan Bin Ismail, Malaysia
11. Muhammad Khalid Khan, Pakistan
12. Muhammad Zaeem Hasan, Pakistan
13. Ousmane Bocoum, Senegal
14. Parviz Tarikhi, Iran
15. Rameeza Siddiqui, Pakistan
16. Yousaf Ali, Pakistan

Recommendations:

1. Generally, all participating member countries have shown their desire for data sharing among ISNET member countries wherever possible.

2. ISNET data sharing charter needs to be established for remote sensing data availability optimization in case of emergency in any of the ISNET member countries.
3. Senegal delegate showed interest in downloading Senegal's data at ground station in Pakistan, whenever Pakistani remote sensing satellite is launched.
4. Iran and Pakistan have nearly common acquisition zones. Pakistan has historical data of LANDSAT-4&5 since 1989 till 1998 and SPOT constellation data since 1992 till to date in various resolution modes. Similarly Iran has LANDSAT's archived data and both the countries are interested to take benefit of the historical/ archived data for undertaking many collaborative projects. Iran also showed interest in the use of high resolution data of SPOT-5 satellite.
5. Malaysia delegate expressed need for cooperation between Malaysia and Pakistan to benefit from Pakistan's expertise in RS-GIS applications particularly with regard to imagery of RazakSAT-2.

Initial Focal Point:

Egypt:	Essam Eldiwany
	+2-02-26251226
Pakistan:	Ibrar ul Hasan Akhtar
Pakistan:	Ijaz Ahmad
Iran:	Kamal Yazdani
	+982613269018, yazdani@isa.ir
Senegal:	Malick Diagne
	+221-338258066, malick.digne@sce.sn
Malaysia:	Maszlan Bin Ismail
	+603-3180-4377, maszlan@angkasa.gov.my
Egypt:	Matar Ali matar
	+2-02-26251226, alimatar49@gmail.com
Pakistan:	Muhammad Khalid Khan
	0092-51-9273314, sgs@suparco.net.pk

WORKING GROUP No 3: ESTABLISHMENT OF REMOTE SENSING RECEIVING STATIONS FOR OIC/ ISNET COUNTRIES

Scope:

- Target mission selection and application analysis
- Cost benefit analysis
- Selection of ground station hardware/software - Preparation of RFQ
- Scrutiny of proposals
- Site selection and RF survey
- Site preparation
- Installation and commissioning
- Operation and maintenance
- Maintainability Service
- Training on the operation and maintenance of ground receiving station

Participants:

1. Abdul Wasiu Mahar, Pakistan
2. Ahmad Ali Gul, Pakistan
3. Aisha Naseer, Pakistan
4. Asmat Ullah, Pakistan
5. Essam Eldiwany, Egypt
6. Hasan Bidar, Iran
7. Ibrar ul Hasan Akhtar, Pakistan
8. Ijaz Ahmad, Pakistan
9. Kamal Yazdani Arjmand, Iran
10. Maszlan Bin Ismail, Malaysia
11. Muhammad Khalid Khan, Pakistan
12. Muhammad Zaeem Hasan, Pakistan
13. Ousmane Bocoum, Senegal
14. Parviz Tarikhi, Iran
15. Rameeza Siddiqui, Pakistan
16. Yousaf Ali, Pakistan

Recommendations:

1. Iranian delegates showed interest in getting assistance and training of all the above mentioned objectives from Pakistan-SUPARCO.

2. Egyptian delegate expressed interest in setting up a new two-channel X-band receiving station for reception of high resolution satellite data and seeking assistance and technical support from Pakistan.
3. Senegal delegate also showed interest in setting up a ground station of the proposed Pakistan high resolution remote sensing satellite, when it is launhed.

Initial Focal Point:

Egypt:	Essam Eldiwany
	+2-02-26251226
Iran:	Hasan Bidar
	+98-21-2229749, hasanbidar@yahoo.com
Malaysia:	Maszlan Bin Ismail
	+603-3180-4377, maszlan@angkasa.gov.my
Egypt:	Matar Ali matar
	+2-02-26251226, alimatar49@gmail.com
Pakistan:	Muhammad Khalid Khan
	0092-51-9273314, sgs@suparco.net.pk
Senegal:	Ousmane Bocoum
	+221-338258066, +221-7764434573, bocoum@cse.sn

WORKING GROUP No 4: SUPPORT IN UPGRADES AND MAINTENANCE OF EXISTING STATIONS

Scope:

- Study and analysis of existing system
- Requirement Elicitation
- Upgradation proposals with cost estimates
- Selection and scrutiny
- Site selection and RF survey
- Site preparation
- Installation and commissioning
- Operation and maintenance
- Maintainability Service

Participants:

1. Abdul Wasiu Mahar, Pakistan
2. Ahmad Ali Gul, Pakistan
3. Aisha Naseer, Pakistan
4. Asmat Ullah, Pakistan
5. Essam Eldiwany, Egypt
6. Hasan Bidar, Iran
7. Ibrar ul Hasan Akhtar, Pakistan
8. Ijaz Ahmad, Pakistan
9. Kamal Yazdani Arjmand, Iran
10. Maszlan Bin Ismail, Malaysia
11. Muhammad Khalid Khan, Pakistan
12. Muhammad Zaeem Hasan, Pakistan
13. Ousmane Bocoum, Senegal
14. Parviz Tarikhi, Iran
15. Rameeza Siddiqui, Pakistan
16. Yousaf Ali, Pakistan

Recommendations:

1. Delegates of Egypt and Iran showed interest in seeking Pakistan's support in the upgrade of existing single channel X-band ground receiving station.

2. Egypt is planning to install environmental control structure (radome) for their outdoor antenna unit. Pakistan would seek their support and information sharing for similar work in Pakistan
3. Senegal delegate showed interest in getting assistance for upgradation of their satellite earth station from any ISNET member country.

Initial Focal Point:

Egypt:	Essam Eldiwany
	+2-02-26251226
Iran:	Kamal Yazdani
	+982613269018, yazdani@isa.ir
Malaysia:	Maszlan Bin Ismail
	+603-3180-4377, maszlan@angkasa.gov.my
Egypt:	Matar Ali matar
	+2-02-26251226, alimatar49@gmail.com
Pakistan:	Muhammad Khalid Khan
	0092-51-9273314, sgs@suparco.net.pk
Senegal:	Ousmane Bocoum
	+221-338258066, +221-7764434573,
	bocoum@cse.sn

WORKING GROUP No 5: TRAININGS

Scope:

- IST program (Bachelors and Masters in communication systems engineering, aerospace engineering, material science engineering), Pakistan
- NCRG program (Masters and short courses in RS-GIS applications), Pakistan
- Short customized trainings in RS-GIS applications at Islamabad and Karachi, Pakistan
- Station operation and maintainability training Islamabad, Karachi, Pakistan
- Satellite programming and request management training, Islamabad, Pakistan
- AIT facility for LEO satellites, Malaysia
- Design, development and manufacturing facilities for communication systems, GPS, communication protocols and aircraft imaging systems, Egypt

Participants:

1. Abdul Wasiu Mahar, Pakistan
2. Ahmad Ali Gul, Pakistan
3. Aisha Naseer, Pakistan
4. Asmat Ullah, Pakistan
5. Essam Eldiwany, Egypt
6. Hasan Bidar, Iran
7. Ibrar ul Hasan Akhtar, Pakistan
8. Ijaz Ahmad, Pakistan
9. Kamal Yazdani Arjmand, Iran
10. Maszlan Bin Ismail, Malaysia
11. Muhammad Khalid Khan, Pakistan
12. Muhammad Zaeem Hasan, Pakistan
13. Ousmane Bocoum, Senegal
14. Parviz Tarikhi, Iran
15. Rameeza Siddiqui, Pakistan
16. Yousaf Ali, Pakistan

Recommendations:

1. Malaysia could provide comprehensive training in LEO earth observation satellite TT&C ground station, AIT for space-segment and ground segment and in-orbit testing and commissioning of LEO satellites.

2. Malaysia could also provide training on design, development, testing of remote sensing satellite.
3. Malaysian delegate proposed to send a few engineers to observe/ learn in-orbit testing and commissioning of PAKSAT-1R and all the other activities regarding TT&C ground station of PAKSAT-1R satellite.
4. Malaysia could provide BE, ME in satellite communication systems engineering, PhD in RS GIS from National University of Technology, Malaysia. The Malaysia delegate expressed possibility of collaboration with Institute of Space Technology, Pakistan. IST also showed interest in cooperation with Malaysia.
5. Pakistani and Malaysian delegates suggested mutual collaboration, visits, sharing of know-how and skills and training on operational activities of the respective ground receiving stations.
6. Egypt has expertise in the design, development of some communication systems, current work in GPS, communication protocols, which it offered to share with ISNET countries
7. Egypt has agreed to provide training in hyper-spectro radiometer.
8. Senegal and Pakistan have agreed for collaborative short term training program on RS-GIS in the domain of agriculture and disaster monitoring and damage assessment.

Initial Focal Point:

Pakistan:	Aisha Naseer
Egypt:	Essam Eldiwany +2-02-26251226
Pakistan:	Farooq A. Khokhar +92-51-9273303, khokhar@ist.edu.pk
Malaysia:	Maszlan Bin Ismail +603-3180-4377, maszlan@angkasa.gov.my
Egypt:	Matar Ali matar +2-02-26251226, alimatar49@gmail.com
Pakistan:	Muhammad Khalid Khan 0092-51-9273314, sgs@suparco.net.pk
Iran:	Office of the president of the Iranian Space Agency +982613269018, yazdani@isa.ir
Senegal:	Ousmane Bocoum

+221-338258066, +221-7764434573,
bocoum@cse.sn

Pakistan: Rameeza Siddiqui

Pakistan: Yousaf Ali
0092-51-9075206, sgs@suparco.net.pk

WORKING GROUP No 6: COLLABORATIVE APPLICATION PROJECTS

Scope:

- Agriculture project (Major crops monitoring for area estimation and yield forecast, precision agriculture)
- Disaster (flood/cyclone/earthquake) monitoring, mitigation and damage assessment
- Land-use projects (site selection/route planning and city GIS etc.)
- Environmental studies and hydrology

Participants:

1. Abdul Wasiu Mahar, Pakistan
2. Ahmad Ali Gul, Pakistan
3. Aisha Naseer, Pakistan
4. Asmat Ullah, Pakistan
5. Essam Eldiwany, Egypt
6. Hasan Bidar, Iran
7. Ibrar ul Hasan Akhtar, Pakistan
8. Ijaz Ahmad, Pakistan
9. Kamal Yazdani Arjmand, Iran
10. Maszlan Bin Ismail, Malaysia
11. Muhammad Khalid Khan, Pakistan
12. Muhammad Zaeem Hasan, Pakistan
13. Ousmane Bocoum, Senegal
14. Parviz Tarikhi, Iran
15. Rameeza Siddiqui, Pakistan
16. Yousaf Ali, Pakistan

Recommendations:

1. Generally delegates of all participating countries showed interest in RS & GIS application in agriculture and disaster management/ mitigation.
2. Malaysian delegate shown special interest in sharing the skills developed for paddy (rice) area estimation and yield forecast modeling with Pakistan. The Malaysian participant would communicate later after discussion with related official of his department

3. Senegal delegate also showed strong interest in utilizing SUPARCO's expertise in the areas of agriculture and disaster management/ mitigation.
4. Egypt has desired to utilize SUPARCO's expertise in the area of remote sensing applications.
5. Senegal delegate showed interest in the development of RS-GIS based crop monitoring system for rice and sugar cane crops with Pakistan.
6. Iranian delegates are interested to utilize Pakistan-SUPARCO's expertise in the areas of agriculture, disaster, land-use and environmental studies and hydrology in the framework of bi-lateral and joint projects

Initial Focal Point:

Senegal:	Beye Gora
	+221-338258066, Gora.Beye@cse.sn
Egypt:	Essam Eldiwany
	+2-02-26251226
Pakistan:	Ibrar ul Hasan Akhtar
Pakistan:	Ijaz Ahmad
Malaysia:	Maszlan Bin Ismail
	+603-3180-4377, maszlan@angkasa.gov.my
Egypt:	Matar Ali matar
	+2-02-26251226, alimatar49@gmail.com
Pakistan:	Muhammad Khalid Khan
	0092-51-9273314, sgs@suparco.net.pk
Iran:	Office of the president of the Iranian Space Agency
	+982613269018, yazdani@isa.ir

پ- توصیه های شبکه بین الدول اسلامی در علوم و فناوری فضایی

ISNET Recommendations

1. If any one of the OIC member countries intends to establish a satellite ground receiving station, ISNET should, on the request of a member country, coordinate assistance and support from amongst the member countries.
2. Expert meeting of the satellite earth stations needs to be conducted biennially in the member countries.
3. ISNET should arrange short trainings on various aspects of satellite earth stations and establish knowledge and data sharing mechanisms.

ت- متن مقاله ارائه شده توسط نگارنده تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی"
ISA's Data Sharing and Ground Receiving Station) (Developments

ISA'S DATA SHARING AND GROUND RECEIVING STATION DEVELOPMENTS

Parviz Tarikhi
Microwave Remote Sensing Research Core
Mahdasht Satellite Receiving Station, ISA
parviz_tarikhi@hotmail.com

ABSTRACT

Remote Sensing is one of the basic topics in the context of the Iranian Space endeavor. This technology is considered as one of the earliest applications of space technology that was developed in Iran along with the space communications and broadcasting activities. Iran established its ground receiving station at the Mahdasht site near Tehran soon after the launch of the earliest commercial remote sensing satellite, Landsat of USA. The site became one of the few top sites around the globe to receive earth observation data that ever has been felt to be necessary for country's development and research programs on monitoring, informed management and planning, and control of its immense and extended natural sources/resources. The Mahdasht site in its fluctuated life span has played a considerable role in supplying mainly national data users' community both in state and private sectors with the needed earth-space data. The site is in the process of developing its data receiving plans and activities for receiving from domestic satellites as well as those which belong to other countries or international organizations. Iran also develops other ground receiving stations throughout the country to cover the need for earth-space data of the users' community as much as possible. Beside the activity for developing its ground receiving stations Iran actively involved with data sharing/providing plans in domestic and international level. This paper tries to give an appropriate detail on the subject activities of Iran and its relevant contribution in this connection, and discusses the status and procedures that have been made/is being made in this field.

INTRODUCTION

Iran entered the space applications era in 1969 by establishing the Asad-Abad Ground Station and installing a 30m-diameter standard-A antenna to connect to the Pacific Intelsat for international communications. With the assistance of the USA the Mahdasht Satellite Receiving Station was established in 1972 following the launch of the American Earth Resource Technology Satellite (ERTS-1) -which later named Landsat-1. The station was among the only five stations around the globe receiving Landsat data at that date. Establishment of the station was Iran's first bilateral cooperation in space technology. Telecommunications, TV broadcasting, remote sensing, navigation, tele-education, weather forecasting, environmental modelling, internet, relief and rescue, etc. are common applications of space technology that have spread widely in Iran. The history of Iran's space efforts and its drive to pursue independent space projects began many years ago before the advent of the Islamic revolution in Iran in 1979.

In 1977 the first official step to establish a space agency was taken. However, the Islamic revolution in Iran in 1979 and the eight-year war with Iraq starting in 1980 halted all efforts in the process of institutionalizing space activities in Iran. Only the continuation of some space applications, such as communications and remote sensing, was allowed. Space technology applications were spread in Iran by various organizations, indicating the country's serious interest in further understanding and benefiting from space. Soon after the launch of the USA's first earth observation system, Landsat, Iran built the Mahdasht Satellite Receiving Station facility 65 km west of Tehran to obtain remote sensing imagery. The Iranian Remote Sensing Center (IRSC) was established, with responsibility for collecting, processing and

distributing relevant imagery products to users throughout the country that ever has been felt to be necessary for country's development and research programs on monitoring, informed management and planning, and control of its immense and extended natural sources/resources. Availability of remote sensing data assisted, for instance, in identifying areas suitable for development and those prone to earthquakes, floods, landslides and other natural disasters and threats; in investigating greenhouse gas emission and air pollution in the large urban areas; in monitoring wetlands and water basins inland and those shared with neighboring countries; and in other useful activities for global benefits. For telecommunications and broadcasting, as well as other applications, the Ministry of Post, Telegraph and Telephone (MPTT), the Iranian Broadcasting Organization and the Ministry of Science were involved.

Satellite remote sensing data has been recognized as an efficient and modern tool for studying and monitoring the environment and resources of Iran and been used since such data was made available commercially. Space remote sensing is one of the basic topics in the context of the Iranian space endeavor. This technology is considered as one of the earliest applications of space technology that was developed in Iran along with the space communications and broadcasting activities. The Mahdasht site in its fluctuated life span has played a considerable role in supplying mainly national data users' community both in state and private sectors with the needed earth-space data. The site is in the process of developing its data receiving plans and activities for receiving from domestic satellites as well as those which belong to other countries or international organizations. Iran also develops other ground receiving stations throughout the country to cover the need for earth-space data of the users' community as much as possible. Beside the activity for developing its ground receiving stations Iran actively involved with data sharing/providing plans in domestic and international level.

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Mahdasht Satellite Receiving Station that is currently affiliated with the Iranian Space Agency (ISA) and officially included in the Alborz Space Center is located approximately 65 kilometers west of Tehran. Established in 1972 the activities and development of the station could be chronicled as below, while it should not be ignored that in each period the driving attitudes and visions of the authorities have practically influenced its progress and development.

Period of 1972-1978: Launch of the United States Earth Resource Technology Satellite (ERTS-1) -which later became Landsat-1- in 1972 actually raised the attention and real interest in remote sensing technology in Iran and is considered as the starting point for such the space related activities in Iran. Soon after, an office for data collection in the Budget and Planning Organization of the date established. Because of rapid developments and progress in the space technologies and remote sensing in particular, Iran was enthusiastically stepping forward in harmony with the global advancements in this connection. Consequently, benefiting the supports from the United States of America (USA) Iran decided to proceed for direct acquisition of satellite data. After compilation of Iran's request by the USA it was agreed that Iran supply data to the 33 countries under coverage of Iran's receiving antenna to be installed. In 1974 a contract was signed between Iran and General Electric Company of USA for installation and conducting a satellite data receiving station.

At the same time, under the Plan for Satellite Data Applications the remote sensing activities officially continued in the National Radio and Television Organization of Iran of the date. Through a feasibility study for site selection, the current site of the Mahdasht Satellite Receiving Station at Mahdasht (formerly named Mard-Abad) of Karaj was distinguished suitable for establishing the station for direct satellite data receiving. The installation process began in 1976 and two phases including tracking and data acquisition completed and operationalized by 1978 while, 3 full coverage of Landsat satellite data of Iran was acquired and archived by the station.

Figure 1: Aerial views of the Mahdasht Satellite Receiving Station (image source: ISA)

According to signed contract between Iran and the US General Electric Company, and based on the global common procedures for satellite data acquisition in USA, Canada and some other countries five phases were planned for set-up in Mahdasht Satellite Receiving Station as follows:

- *First Phase,* including installation and operationalizing the facilities for tracking the Earth resource satellites and direct data acquisition from those satellites
- *Second Phase,* including installation and operationalizing the facilities for recording and data correction
- *Third Phase,* including installation and operationalizing the facilities for analysis and data processing
- *Fourth Phase,* including installation and operationalizing the facilities for data management
- *Fifth Phase,* including installation and operationalizing the facilities for data printing, proliferation and production

The advent of the Islamic Revolution in Iran in 1978 urged rapid quit of the US contractor and suspension of the project implementation following which the management and coordination of the plan was put on Iran.

Period of 1978-1991: Change in the visions and emerging new managerial attitudes because of the Islamic revolution in Iran put the plans for development of the Mahdasht Satellite Receiving Station and continuation of its activities in a long-lasting ambiguity. The experts, engineers and even the mid-rank managers of the station began the efforts for saving it and justifying the top authorities and decision-makers of the importance and necessity for continuation of the work of such the station and the role that remote sensing and other space technologies can play in informed management and control of the resources and available potentials for development of the country. Management of the Mahdasht Satellite Receiving Station was shifted from the National Radio and Television Organization to the Budget and Planning Organization again. The main and considerable success for the Mahdasht Satellite Receiving Station in this period that was realized in light of the efforts and work of the experts and engineers of the station is as follows:

- Operationalizing and conducting the installed facilities for direct data acquisition from meteorological NOAA satellites series
- Training the experts and technologists of the user organizations and institutes throughout the country for transferring the technology of satellite applications

- Installation and operationalizing the second, third, fourth and fifth phases of the station for data production and proliferation

Production and availability of the full coverage of satellite data of Iran acquired and archived by the station provided the possibility for access to the satellite data of Iran for implementing different projects and plans around the country and holding workshops for transferring the knowledge and expertise of satellite data applications.

Period of 1991-1996: In line with the efforts made by the experts for development of remote sensing technologies throughout the country in the previous period, some commitments officially made for changing the existing situation and transition from the Plan for Satellite Data Applications and further institutionalizing of the remote sensing activities. In 1991 the Parliament of the Islamic Republic of Iran passed the law for transferring from the Plan for Satellite Data Applications to the state-run firm of the Iranian Remote Sensing Center (IRSC). According to the approval IRSC became affiliated to the Ministry of Post, Telegraph and Telephone (MPTT) of the date. The latter changed to the Ministry of Communications and Information Technology according to the approval of the Iranian Parliament on 10 December 2003.

Period of 1996-2002: Approval of the law for changing the Plan for Satellite Data Applications to the state-run firm of IRSC caused some legal problems for IRSC in terms of securing its financial sources and inability for developing its plans and programs. The authorities decided to downsize IRSC and confined the activities of the Mahdasht Satellite Receiving Station that finally led to suspension of the activity of the station temporarily. However, before the suspension, the activities of the fifth and first phases including data production and proliferation, and direct data acquisition from meteorological satellites continued in its lowest level.

Figure 2: The view of the antennas installed at the Mahdasht Satellite Receiving Station (image source: ISA)

Period of 2002-date: Administrational and organizational changes in MPTT and its transition to the Ministry of Communications and Information Technology followed by the establishment of the Iranian Space Agency (ISA) in February 2004. ISA covered officially, according to its establishment law, all the remote sensing activities throughout the country. Consequently the activation of the Mahdasht Satellite Receiving Station and its revival was highly considered by the authorities. Reconstruction and operationalizing of the Mahdasht Satellite Receiving Station practically began in 2003. In continuation all the active receiving facilities of ISA in Saadat Abad headquarters in north of Tehran translocated gradually to the Mahdasht Satellite Receiving Station. New specialists as well as staff have been employed. Although the antenna for receiving from Landsat has been abandoned, other facilities for receiving new generation

satellites data in both S- and X-band frequencies that are used by existing and future satellites including NASA's TERRA-MODIS [Moderate Resolution Imaging Spectro-radiometer] (since October 2001), Russian OKEAN satellite, Indian IRS [Indian Remote Sensing] (In September 2002, the station was made capable of receiving data from IRS satellite; it was active for only few years), NOAA-AVHRR [Advanced Very High Resolution Radiometer] (The center has obtained/ stored more than ten years from NOAA) and Chinese FY-2 meteorological satellites continues and the plans for receiving from other satellites is in the way. This all is in line with the plans for concentrating the remote sensing activities of ISA in Mahdasht Station and developing it to become the Alborz Space Center. The site will comprise of the most comprehensive and multi-task ground space complexes, laboratories as well as work, living and leisure facilities for the Iran's space science and technology specialists, scientists and officials.

Development of other ground receiving stations

Iran has been continuously developing its ground segments and facilities for communications and data acquisition throughout the country for many years. Boomhen, Asad-Abad and Isfahan are the ground stations established mainly for communication purposes, while the Mahdasht Satellite Receiving Station is being developed to become the Alborz Space Center. The site will comprise the most comprehensive and multi-task ground space complexes as well as working, living and leisure facilities for Iran's space science and technology specialists, scientists and officials. ISA's remote sensing activities are presently conducted by its ''Remote Sensing Administration'', which is largely situated in the Alborz Space Center. There is only one office for remote sensing located in ISA headquarters in Tehran. The official tasks of the former IRSC are presently allotted by the Remote Sensing Administration of ISA. There are also other ground stations established for receiving remote sensing data managed and controlled by the private sector, universities and non-civilian sector. ISA is in the process of developing the ground facilities in a few new sites in Tabriz (East Azerbaijan Province), Isfahan (Isfahan Province), Shiraz (Fars Province), Mashad (Khorasan-e Razavi Province) and Chabahar (Sistan and Baluchistan Province).

DATA SHARING DEVELOPMENT

In addition to the activities and plans for direct satellite data receiving which is subsequently archived for the future use, the Iranian Space Agency actively develops its plans for providing, supplying and archiving data retrieved through the third party bodies including the inland and international firms and organizations which provide non-real-time data for enjoying the needs of the country's user community. ISA archiving system is searchable through the web site of the agency that provides quick-looks making the potential and interested users capable of finding and locating the available archived data in the data archive of the Iranian Space Agency based in Alborz Space Center. The users then may order their needed data through the users' data supplying office of the Iranian Space Agency. The archive is planned to be developed and extended to be included in a comprehensive data center to comply the increasing needs of the community of data users domestically and internationally.

ISA also contributes to the data sharing initiatives in national, regional and international levels. The activity in this connection includes the involvement in the initiatives such as UN-SPIDER in the international level, UN-ESCAP RESAP in the regional level mainly focusing on the disaster mitigation and management plans. ISA has developed the regional office for UN-SPIDER which is capable of providing data services to inland and the neighboring countries in case of the advent of disasters. Moreover, there have been official efforts and commitments to establish a center for informed space and communication-based disaster management in Iran under the ESCAP's Regional Space Application (RESAP) initiative.

REFERENCES

[1] Tarikhi, Parviz: *Mahdasht Satellite Receiving Station Verging into a Space Center*, Tehran, Iran, 13 October 2008, http://rescommunis.wordpress.com/2008/10/13/guest-blogger-parviz-tarikhi-mahdasht-satellite-receiving-station-verging-into-a-space-center/ (accessed 20 June 2011)

[2] Harvey, Brian; Smid, Henk; Pirard, Theo: *Emerging Space Powers; the New Space Programs of Asia, the Middle East, and South America*, Springer/Praxis, February 2010, pp. 255-264

[3] Tarikhi, Parviz: *Iran's space program; Riding high for peace and pride*, Space Policy International Journal (Elsevier), Issue 3, Volume 25, August 2009, pp. 160-173 (DOI: 10.1016/j.spacepol.2009.05.010).

[4] ISA's web site (Persian Version): *The Milestones of the Mahdasht Satellite Receiving Station*, http://www.isa.ir/pagecontent.php?rQV===AfAlTM4MzNApjclJWb15GZJV2ZhBHfABDQ6UGc5RFduVGdu92Y8BEMApTZwlHVlJXd0NWdyR3c8BEMApTZwlHVkxWamxHQ2IDQ6UGb0lGd (accessed 20 June 2011)

Parviz Tarikhi (http://parviztarikhi.wordpress.com) is a space science and technology specialist in Iran majoring in radar remote sensing since 1994. He holds a PhD degree in physics focusing on microwave remote sensing. He heads the Microwave Remote Sensing Research Core at the Mahdasht Satellite Receiving Station. He has been involved with the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS) since 2000, including as Second Vice-Chair and Rapporteur in 2004-06 of the committee bureau. Since 2001 he has co-chaired Action Team number 1 of UNISPACE-III with the mission 'to develop a comprehensive worldwide environmental monitoring strategy'. From 2004-07 he led the Office for Specialized International Cooperation of the Iranian Space Agency. He is also a freelance journalist and technical writer. He has made in the mean time years of research and study on the developments and status of space science and technology with a particular focus on Iran.

ث- پاورپوئنت مقاله ارائه شده توسط نگارنده تحت عنوان "پیشرفتهای سازمان فضایی ایران در تشریک داده ها و ایستگاه گیرنده زمینی"
ISA's Data Sharing and Ground Receiving Station) (Developments

ISA'S DATA SHARING AND GROUND RECEIVING STATION DEVELOPMENTS

Parviz Tarikhi, PhD
Microwave Remote Sensing Research Core
Mahdasht Satellite Receiving Station, Alborz Space Center
Iranian Space Agency(ISA)
parviz_tarikhi@hotmail.com
http://parviztarikhi.wordpress.com

NATIONAL SPACE PROGRAMS AND ACTIVITIES

Iranian Space Agency (ISA)

-National body for multi-sectorial coordination and collaboration in space technology applications

-Establishment: *2004*
under the *Ministry of Communications and Information Technology*
-Statute approval: *2005*, in *2007* it is changed and received approval in *2008*

- On *October 29, 2010* ISA is annexed to the *Presidency Institution*

-Institutional Chart: is in the process of approval

-Plan: considerable investment in infrastructure in space technology during the fourth master plan of country, which is being extended to the next master plan.

Iranian Space Agency

NATIONAL SPACE PROGRAMS AND ACTIVITIES

ISA covers all space-related activities as a single state organization.

ISA aims in

***Policy-making on:**
the applications of space technologies aimed at the peaceful uses of outer space,
manufacturing, launching and use of national and research satellites,
***Approving the space-related programs of state and private institutions and organizations,**
***Approving the long- and short-term programs of the country's space sector,**
***Promoting partnership between the private and cooperative sectors in efficient uses of space; and**
***Developing guidelines concerning regional and international cooperation in space issues**

Iranian Space Agency

NATIONAL SPACE PROGRAMS AND ACTIVITIES

Political Commitment and Institutional Aspects

***Wide-ranging program for development and benefiting the potentials and possibilities**

***Large pool of qualified and trained personnel**

NATIONAL SPACE PROGRAMS AND ACTIVITIES

* More than seven universities conducting undergraduate and postgraduate courses covering different areas of space science and technology, including
  - remote sensing,
  - GIS,
  - satellite meteorology,
  - satellite communications,
  - aeronautics and
  - astronomy

* About 14 other scientific institutions and bodies also engaged in space science research and education

Fields of activity include:

- Agricultural studies and assessments
- Technology promotion
- Geological studies in variety of fields
- Surveying and mapping (producing and correcting)
- Water resource management
- Weather and climate studies and forecast
- Environmental pollution

Iranian Space Agency

NATIONAL SPACE PROGRAMS AND ACTIVITIES

ISA is mandated to develop the country's remote sensing capabilities in all aspects of its technology and applications.

* Prior to establishment of ISA in February 2004, IRSC were functioning as the main national agency responsible

*Remote sensing; principal component of Iran's national space program.

*Besides ISA, approximately 50 agencies in the country involved in remote sensing technology and its applications, including government ministries and organizations, universities and private sector.

RS and GIS being used by the entities in a variety of applications in

*agriculture,
*water resources management,
*geological mapping,
*mineral exploration,
*rangeland management,
*cartography,
*land-use planning and desertification

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

Earth observation satellite receiving facilities

Iran installed its ground station for receiving satellite (*Landsat*) remote sensing data in 1976 at Mahdasht (Karaj), 65 km northwest of Tehran.

the earliest ground receiving station in the entire region that had been commissioned

Mahdasht Satellite Receiving Station (MSRS)

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

Earth observation satellite receiving facilities

Mahdasht Satellite Receiving Station (MSRS)

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

* *currently affiliated with ISA,*
* *officially included in the Alborz Space Center (Mahdasht Space Center),*
* *established in 1972*
* *the activities and development of the station is chronicled as:*

Period 1972-1978
Period 1978-1991
Period 1991-1996
Period 1996-2002
Period 2002-date

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 1972-1978:

* US launches Earth Resource Technology Satellite (ERTS-1) -later called Landsat-1- in 1972
* an office for data collection in the Budget and Planning Organization is established
* with US supports Iran decided to proceed for direct acquisition of satellite data
* it was agreed that Iran supply data to the 33 countries under coverage of Iran's receiving antenna to be installed
* in 1974 GE and Iran agreed to install a satellite data receiving station
* under the Plan for Satellite Data Applications the remote sensing activities officially continued in the National Radio and Television Organization of Iran
* the current site of MSRS at Mahdasht, Karaj was selected for establishing the station for direct satellite data receiving
* the installation process began in 1976 and two phases including tracking and data acquisition completed and operationalized by 1978
* three full coverage of Landsat satellite data of Iran was acquired and archived by the station.

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 1972-1978:

- Phases planned for MSRS:

Phase I, tracking the Earth resource satellites and direct data acquisition from those satellites
Phase II, recording and data correction
Phase III, analysis and data processing
Phase IV, data management
Phase V, data printing, proliferation and production

* the Islamic Revolution in Iran in 1978 causes suspension of the project
* the management and coordination of the plan is put on Iran

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 1978-1991:

* long-lasting ambiguity
* management of the Station is shifted from the National Radio and Television Organization to the Budget and Planning Organization again
* the main and considerable success for the MSRS in this period:
  - Operationalizing and conducting the installed facilities for direct data acquisition from NOAA
  - Training the experts and technologists for transferring the technology of satellite applications
  - Installation and operationalizing the II, III, IV & V phases for data production and proliferation
  - Production and making available the full coverage of satellite data of Iran
  - Possibility for access to the satellite data of Iran for implementing different projects and plans around the country
  - Holding workshops for transferring the knowledge and expertise of satellite data applications

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 1991-1996:

* In 1991 the Parliament of I. R. Iran passed the law for transferring from the Plan for Satellite Data Applications to the state-run firm of the Iranian Remote Sensing Center (IRSC)
* IRSC became affiliated to the Ministry of Post, Telegraph and Telephone (MPTT) of the date; the latter changed to the Ministry of Communications and Information Technology according to the approval of the Iranian Parliament on 10 December 2003

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 1996-2002:

* Approval of the law for changing the Plan for Satellite Data Applications to the state-run firm of IRSC caused some legal problems for IRSC in terms of securing its financial sources and inability for developing its plans and programs

* The authorities decide to downsize IRSC and confined the activities of MSRS that finally led to suspension of the activity of the station temporarily

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 2002-date:

* Administrational and organizational changes in MPTT and its transition to the Ministry of Communications and Information Technology followed by the establishment of the Iranian Space Agency (ISA) in February 2004.
* ISA covered officially, according to its establishment law, all the remote sensing activities throughout the country.
* the activation of MSRS and its revival was highly considered by the authorities.
* reconstruction and operationalizing of MSRS practically began in 2003
* all the active receiving facilities of ISA in Saadat Abad headquarters in north of Tehran translocated gradually to MSRS; new specialists as well as staff have been employed.

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station

Period of 2002-date:

* Although the antenna for receiving from Landsat has been abandoned, other facilities for receiving new generation satellites data in both S- and X-band frequencies that are used by existing and future satellites including:

- NASA's TERRA-MODIS [Moderate Resolution Imaging Spectro-radiometer] (since October 2001)
- Russian OKEAN satellite,
- Indian IRS [Indian Remote Sensing] (In September 2002, the station was made capable of receiving data from IRS; it was active for only few years)
- NOAA-AVHRR [Advanced Very High Resolution Radiometer] (The center has obtained/ stored more than ten years from NOAA)
- Chinese FY-2 meteorological satellite
- plans for receiving from other satellites is in the way

* this all is in line with the plans for concentrating the remote sensing activities of ISA in MSRS and developing it to become the Alborz Space Center.

* The site will comprise of the most comprehensive and multi-task ground space complexes, laboratories as well as work, living and leisure facilities for the Iran's space science and technology specialists, scientists and officials.

Iranian Space Agency

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Mahdasht Satellite Receiving Station (MSRS) *Iranian Space Agency*

EARTH OBSERVATION SATELLITE SYSTEMS

GROUND RECEIVING STATIONS DEVELOPMENT

Other ground receiving stations

* Iran continuously developing its ground segments and facilities for communications and data acquisition throughout the country for many years
* Boomhen, Asad-Abad and Isfahan are the ground stations established mainly for communication purposes,
* MSRS being developed to the Alborz Space Center
* ISA's remote sensing activities are presently conducted by its ''Remote Sensing Administration''; it is almost situated in the Alborz Space Center.
* The official tasks of the former IRSC are presently allotted by the Remote Sensing Administration of ISA.
* other ground stations established for receiving remote sensing data managed and controlled by the private sector, universities and non-civilian sector
* ISA is in the process of developing the ground facilities in a few new sites in
  Tabriz (East Azerbaijan Province),
  Isfahan (Isfahan Province),
  Shiraz (Fars Province),
  Mashad (Khorasan-e Razavi Province)
  Chabahar (Sistan and Baluchistan Province).

Iranian Space Agency

EARTH-SPACE DATA & KNOWLEDGE SHARING

DATA SHARING DEVELOPMENT

* In addition to the activities and plans for direct satellite data receiving which is subsequently archived for the future use, ISA actively develops its plans for providing, supplying and archiving data retrieved through the third party bodies including the domestic and international firms and organizations which provide non-real-time data for enjoying the needs of the country's user community
* ISA archiving system is searchable through the web site of the agency that provides quick-looks making the potential and interested users capable of finding and locating the available archived data in the data archive of the Iranian Space Agency based in Alborz Space Center
* The users then may order their needed data through the users' data supplying office of the Iranian Space Agency
* The archive is planned to be developed and extended to be included in a comprehensive data center to comply the increasing needs of the community of data users domestically and internationally

Iranian Space Agency

NATIONAL SPACE PROGRAMS AND ACTIVITIES

DATA SHARING DEVELOPMENT

* ISA initiated two databases on
earth resources satellite data and
remote sensing education courses in the country,
& more databases are in the way

EARTH-SPACE DATA & KNOWLEDGE SHARING

DATA SHARING DEVELOPMENT

* ISA contributes to the data sharing initiatives in national, regional and international levels
* the activity includes the involvement in the initiatives such as
UN-SPIDER in the international level,
UN-ESCAP RESAP and APSCO data sharing plans in the regional level
mainly focusing on the disaster mitigation and management plans.

* ISA has developed the regional office for UN-SPIDER which is capable of providing data services to inland and the neighboring countries in case of the advent of disasters.
* official efforts and commitments is continued to establish a center for informed space and communication-based disaster management in Iran under the ESCAP's Regional Space Application (RESAP) initiative

Iranian Space Agency

READY TO COOPERATE JOINTLY IN BILATERAL, REGIONAL, GLOBAL LEVELS

* ISA is now ready and interested to contribute and participate in more plans for data sharing plans particularly with the ISNET member countries.

* It is hoped that the current Expert Meeting will suggest and elaborate suitable ways and plans in this connection.

Iranian Space Agency

Thank you!

Iranian Space Agency

ج- پاورپوئنت مقاله ارائه شده توسط عضو هیئت ایرانی آقای کمال یزدانی ارجمند تحت عنوان "روشهای ردیابی ماهواره های سنجش از دور" (Tracking Methods of Remote Sensing Satellites)

TRACKING METHODS

OF

REMOTE SENSING

SATELLITES

Presented By : Kamal Yazdani Arjmand
Iranian Space Agency (ISA)

Most Important Tasks Of Receiving Stations

- Detection
  And
- Tracking

  of Satellite

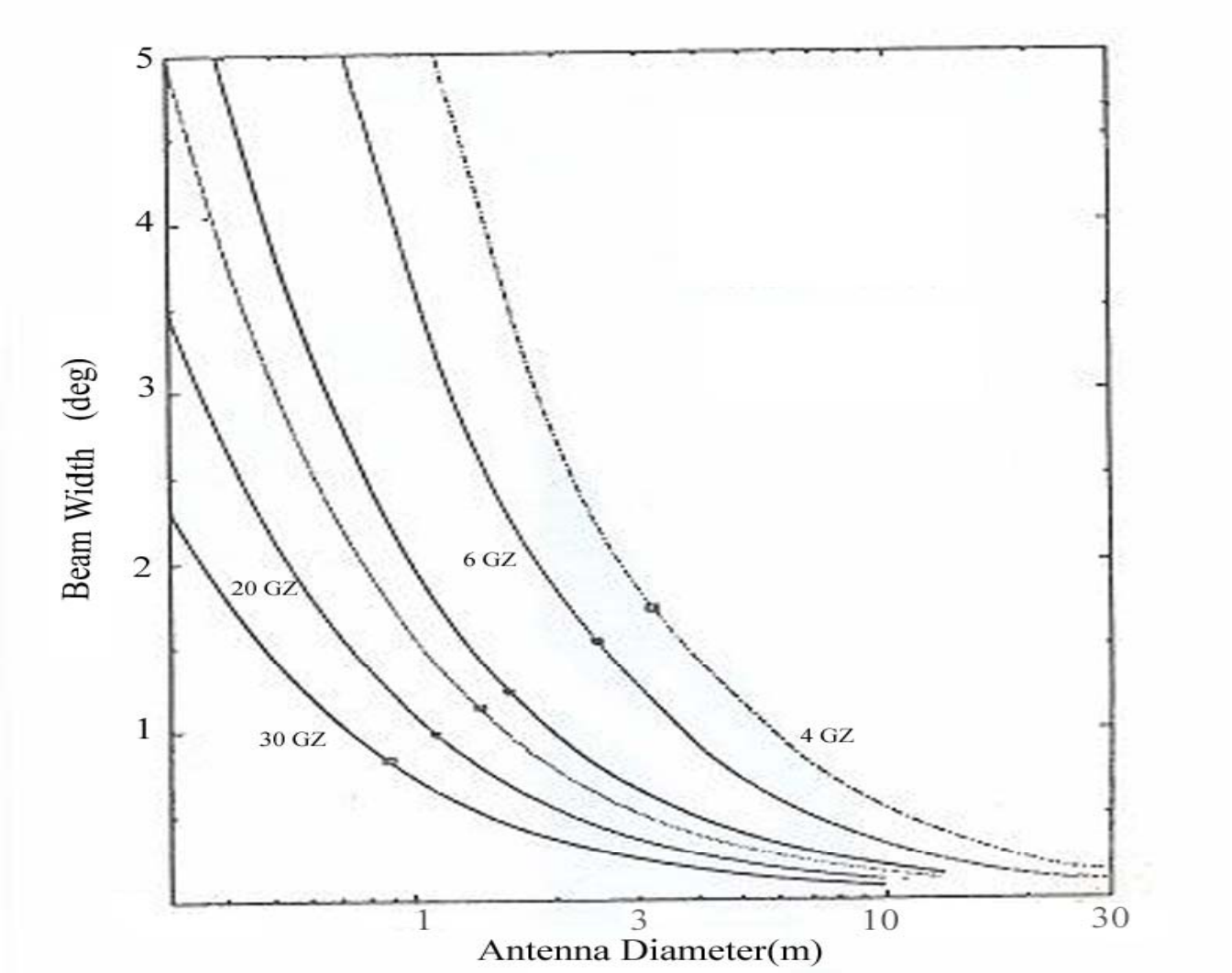
Satellite Tracking Definition

The process of continuously adjusting the orientation of an antenna so that its boresight follows the movements of the satellite

Tracking Types Dependent To :

- *Antenna Beam Width*
- *Apparent Motion* of *Satellite*
- *Carrier Frequency*

BEAM WIDTH–DIAMETER CURVE



Tracking Methods

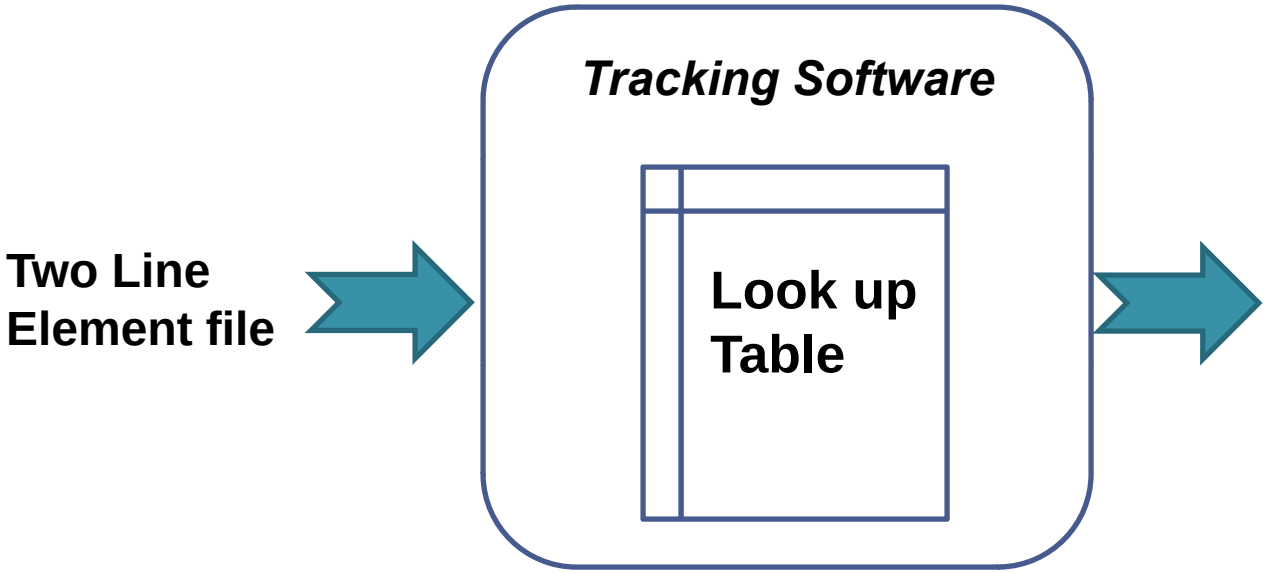
- Program tracking
- Auto tracking

Program tracking

It is optimum for Receiving stations that have:

- ***High λ/D***
  Mean that F.D must be low
- ***High Beam Width***

Program tracking Implementation



Time	*Elevation Angle*	*Azimuth Angle*
11:1:25	0.5	210
…	…	…
11:7:05	67	54
…	…	…

Program Tracking Advantages

- The Sun Outage not effect The process of tracking
- The Tracking is independent to the satellite signals

Auto Tracking

It is the optimum for Receiving stations that have:

- *Low λ/D*
  - *Mean that F.D must be high*
- *Low Beam Width*

Auto Tracking Specifications

- is a Hardware Impementation
- Use Satellite Signals :
  - Data Signal

  or
  - Beacon Signal

Auto Tracking Advantages

- *High Accuracy*
- *Independent to Telemetry Informations*

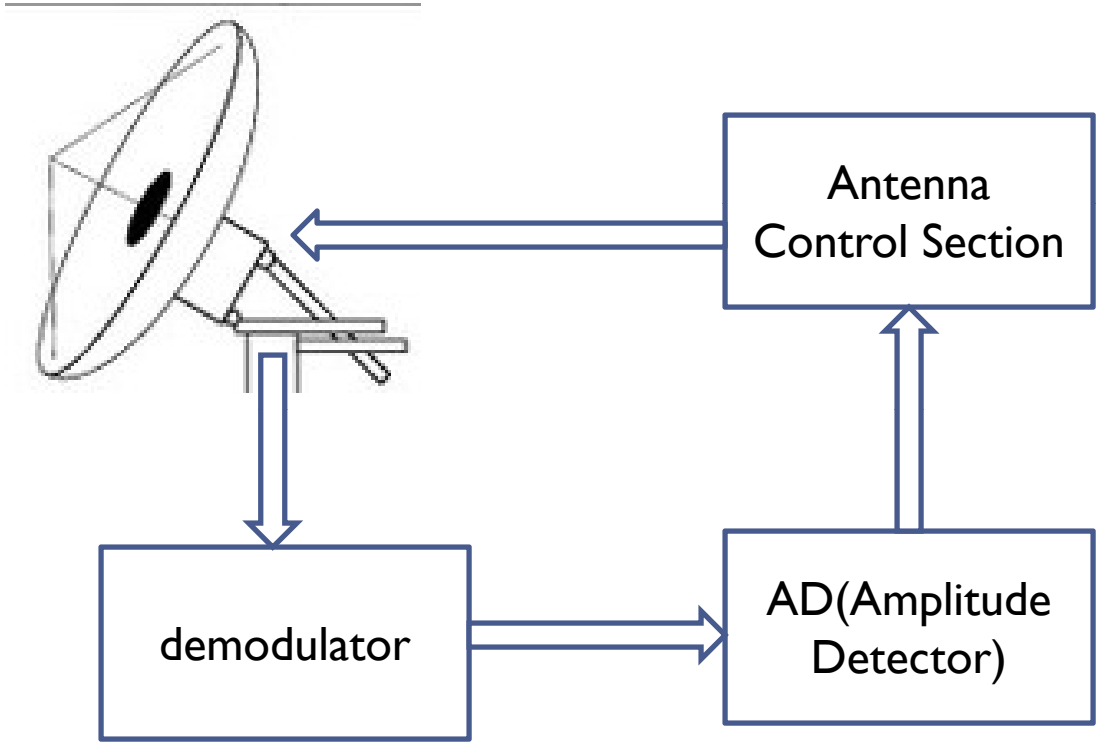
Auto Tracking Methods

- *Step tracking*
- *Mono pulse*

Step Tracking

- *Use Deviations in Received signal*
- *Data are stores when the maximum gain achieves*
- *The Antenna by Try & Error , Moves to Achieve best Signal Level.*

Step Tracking



Step Tracking

ADVANTAGES :

- ✓ Easy Design
- ✓ Low Cost
- ✓ Need One RF Channel

MonoPulse Trackiing

- *Use Beacon Signal*

- *It needs four feed horn Or Dipole located in Antenna axis symmetrically*

- *If Differences between these signals be zero , The satellite be Tracked well*

Step Tracking

DISADVANTAGES :

- ✓ Low Accurate
- ✓ Slow Time Response
- ✓ Sensitive to Noise Level

MonoPulse Trackiing

ADVANTAGES :

- ✓ Fast Time Response
- ✓ High Accuracy
- ✓ No Complex Mechanical Motion

Parts are needed

MonoPulse Trackiing

DISADVANTAGES :

- ✓ Expensive
- ✓ Antenna Power Supply must be Strong and is Complicated

Thank You