



Geoscience and Remote Sensing Society

GRS-S FARS Technical Committee

Annual Meeting

25th July 2007
IGARSS
Barcelona

Joel Johnson
Chair, GRS-FARS

David Kunkee
Co-chair, GRS-FARS





Agenda

- Overview of FARS committee
- Officer Nominations (term Nov 2007-Oct 2009)
- Special reports:
 - ⇒ Preparation for SFCG-27 (John Zuzek/Tom Von Deak, NASA)
 - ⇒ Report on 3rd NOAA passive sensing workshop (D. Kunkee)
- Other related activity updates
 - ⇒ NRC Spectrum Survey Panel (A. Gasiewski)
 - ⇒ URSI 2008 General Assembly Session (J. Johnson)
 - ⇒ ITU-D Study group on disaster management (T. Von Deak)
 - ⇒ GEO Task AR-06-11
- Old/New Business:
 - ⇒ Update to webpage, input solicited
 - ⇒ Possible special section in TGRS on RFI studies/mitigation?
 - ⇒ Future RFI campaigns
 - ⇒ Recommendations for FARS focus
 - ⇒ Other business

FARS websites:

<http://www.grss-ieee.org/menu.taf?menu=Resources&detail=include&html=FarsDetail>,

<http://www.ece.osu.edu/~johnson/fars/>

GRS-S FARS Technical Committee





Frequency Allocation for Remote Sensing (FARS) Technical Committee

- Objectives

- ⇒ ***Interface between GRSS and the frequency regulatory process***

- Help to educate membership on frequency regulatory process
- Gather and distribute information on current frequency management events to membership
- Organize GRSS efforts to impact regulatory process as appropriate

- ⇒ ***Coordinate and advocate GRSS technical input to regulatory organizations and working parties***

- Standardization of methods applied to analyses
- ITU-R SA 1028, 1029, ITU-R 577, 1166
- Respond to requests for sensor and user information
- Investigation of RF interference and mitigation



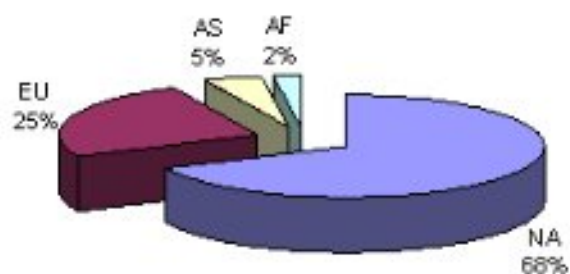


Membership

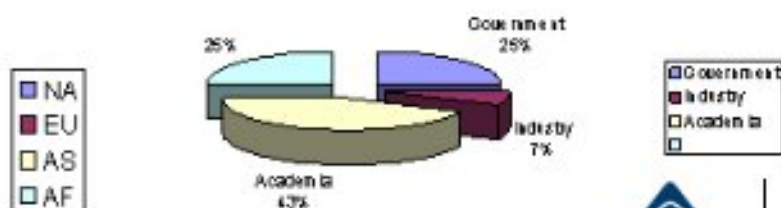
New members are welcome, you are encouraged to recruit/ spread the word!
Interested parties (must be GRS members) contact johnson.1374@osu.edu

- July 2007
 ⇒ 51 Members; 10 Countries

FARS Membership by Continent



FARS Membership by Organization



Other: Non Profit, FFRDC (LL, JPL, Aero)





Nominations for Officers

- According to GRSS rules, technical committee officers serve a two year term (max two terms)
- Basic responsibilities (split among officers) include
 - ⇒ Preparing (and presenting if available) short reports for 3 GRSS Adcom meetings/year
 - ⇒ Attend/present at the IGARSS Technical committees dinner
 - ⇒ Organize annual IGARSS FARS session
 - ⇒ Maintain membership list and website
 - ⇒ Defining and implementing any other agenda for FARS
- Chair elected by membership, co-chair appointed by chair
- Election of chair to be held in October 2007
- New terms will begin November 2007
- Nominations/Volunteers sought, self nominations welcome





FARS Officer History

Year	Officers
2000-01	Ram Narayanan
2001-02	Ram Narayanan, Chris Ruf
2002-03	Chris Ruf, Ram Narayanan
2003-04	David Kunkee, David DeBoer
2004-05	David Kunkee, David DeBoer
2005-06	Joel Johnson, David Kunkee
2006-07	Joel Johnson, David Kunkee

Space Frequency Coordination Group



Presented by John Zuzek (NASA)
to GRS-S FARS Technical Committee
25-July-2007
Barcelona, Spain



What is the SFCG?

The SFCG is an **informal** group comprised of the major civil space agencies and related national and international scientific organizations

Its main objectives are:

- To provide working level coordination of international RF spectrum usage among users of the science services
- To adopt agreements that optimise the use of the allocated bands
- To agree common policies and identify long-term targets related to potential changes to the international regulations (ITU-R, WRC, Regional Groups)



History

- 1980 - Group jointly chartered by Director-General of European Space Agency (ESA) and NASA Associate Administrator for Space Tracking and Data Systems.
- 1980 - First formal meeting held in Toulouse, France.
- Attended by representatives from 10 national space agencies, one scientific organization and ESA.
- English adopted as the official working language.
- SFCG web site: <http://sfcgonline.org>



Scope

- The radio services covered by the SFCG activity are:
 - Space Research (data communications and sensors)
 - Space Operations
 - Earth Exploration-Satellite (data communications and sensors)
 - Meteorological-Satellite
 - Inter-Satellite
- Therefore,
 - Remote sensing is only one (important) element of the SFCG activity
 - Remote sensing other than from satellites is not within the SFCG scope



Members (Space Agencies)

ASA	Austria	INTA	Spain
ASI	Italy	ISRO	India
BNSC	United Kingdom	JAXA	Japan
		NASA	USA
CAST	China	NIVR	Netherlands
CNES	France	NOAA	USA
CONAE		NSA	Malaysia
	Argentina	NSAU	
CSA	Canada		Ukraine
CSIRO		NSPO	



Observers

- Consultative Committee on Space Data Systems (CCSDS Panel 1)
- Coordination on Geostationary Meteorological Satellites (CGMS)
- Inter-Union Commission on Frequency Allocations for Radio Astronomy and Space Science (IUCAF)
- ITU Radiocommunication Sector (ITU-R)
- Committee on Environmental Observation Systems (CEOS)
- World Meteorological Organization (WMO)
- International TOVS Working Group (ITWG)
- **IEEE GRSS Frequency and Allocations for Remote Sensing (FARS)**



Working Methods

- Group meets at approximate one year intervals with each meeting hosted by a member agency
- Exec. Sec. is Head of ESA Frequency Management Office, providing continuity, and supporting the meeting.
- Each meeting has an agenda as well as Action Items from the previous meeting and inputs are solicited for any of these topics as well as any topic of interest to members/observers
- Input papers are discussed and output papers prepared:
 - Action Items: to be completed for next SFCG meeting
 - Resolutions: express action for SFCG members
 - Recommendations: express action, to be pursued by SFCG members outside the group, e.g. within member agencies and administrations



SFCG Advantages

- Although the SFCG is an informal group, its positions on regulatory items have impact on the decision makers
- ITU-R has recognized the SFCG role in coordination of space science missions

SFCG Limitations

- As an informal group, SFCG cannot “officially” speak for anyone; no formal staff or budget for spectrum activities
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SFCG Achievements in Remote Sensing Spectrum Matters

- Successful world-wide agreement on the requirements for the revision of the EESS (passive) allocations in the 50-60 GHz range (WRC-97).
- Successful world-wide agreement by the satellite passive sensing community on the requirements for the revision of passive allocations above 71 GHz (WRC-2000).
- Global revision of the satellite passive sensors protection criteria, that resulted in the revision of the corresponding ITU-R Recommendations in 2002
- Agreement on the mechanisms to coordinate the future cloud radar missions at 94 GHz with the radio astronomy operations



SFCG Current Work in Remote Sensing

- SFCG has “standing agenda item” on EESS, MetSat and disaster management issues, including active and passive sensors – any inputs of interest are welcome
- Action Item 26/4 to “Update/Revise EESS Passive Band Requirements” contained in Resolution 21-2R2, especially the requirements for 275-3000 GHz
- Intersessional Working Group on the use of remote sensing in disaster management
- Societal benefits of remote sensing



Current Remote Sensing Resolutions and Recommendations

- RES 5-9R1 "Protection of Frequency Bands Allocated to Passive Sensing and Radio Astronomy" (2001)
- RES 19-6R1 "EESS Active Sensing Requirements > 100 GHz" (2000)
- RES 21-2R2 "Requirements, Performance, and Protection Criteria for EESS (Passive) Sensors" (2004)
- RES 21-3R2 "Protection of EESS (Passive) Sensors from Ultra Wideband Device Emissions" (2005)
- RES 23-2 "Use of Synthetic Aperture Radars in the Band 5250-5570 MHz" (2003)
- RES 23-3 "Use of the Allocation for EESS (active) in the Band 432-438 MHz" (2003)
- RES 24-2 "Use of the allocation for EESS (active) in the band 94-94.1 GHz" (2004)
- REC 18-1 "Use of the Bands 31.3–31.8 GHz and 36-37 GHz for EESS passive Sensing" (1999)
- REC 24-2 "Frequency assignment guidelines for active remote sensing in the Mars region" (2004)



Third NOAA passive sensing workshop

- Presentations (See: http://www.sfcgonline.org/pmw_000.aspx)
 - ⇒ General overview of the spectrum management process, in USA and internationally (International Telecommunication Union -- ITU)
 - ⇒ Overview of 3 ITU passive recommendations (RS.515, RS.1028 and RS.1029) with particular attention to RS.515, which defines passive spectrum requirements
 - ⇒ Requirements for meteorology, focusing on sensitivity and potential for error when integrity or accuracy of satellite measurements is compromised
 - ⇒ EUMETSAT polar system passive requirements (existing and future), focusing on 3 instruments – Microwave Sounder (MWS), Microwave Imager (MWI) and Millimeter Wave Mission (MMW) with particular emphasis on water vapor, sea surface temps, temperature profiling and rain rate
 - ⇒ NASA's cloud sensing mission



Third NOAA passive sensing workshop (cont'd.)

- Presentations (cont'd.)
 - ⇒ Comprehensive application and assessment information for most bands of interest to passive sensing community
 - ⇒ Impact of radio frequency interference (RFI) on meteorological products based on passive sensor information
 - ⇒ Spectrum management activities of the U.S. National Academies of Science, the Committee on Radio Frequency's Handbook of Frequency Allocations and Spectrum Protection for Scientific Uses, upcoming activities to promote protection of passive sensing spectrum
 - ⇒ Working relationship between regulatory and science communities, focusing on improving this relationship
 - ⇒ Disaster management and its relationship/dependency on Earth exploration-satellite service's sensing missions





Third NOAA passive sensing workshop (cont'd.)

- Work Session
 - ⇒ Emphasized modifying and adding bands, especially above 275 GHz
 - ⇒ Produced a "Change Table" containing specific changes to the table currently found in ITU Recommendation RS.515
 - ⇒ Comments are sought from the passive sensing community on these changes found in table 2 of the workshop summary available at:
<http://www.sfcqonline.org/2007PassiveSensingMicrowaveWorkshopProceedings-Summary.pdf>
 - ⇒ Final table will be produce based on comments received
- Future workshops planned, but not necessarily on a regular (annual) basis

Spectrum Study Overview

IGARSS
Barcelona, Spain

David Lang
Research Associate, BPA

Spectrum Study Statement of Task

The committee will prepare a report exploring the scientific uses of the radio spectrum which will:

- Portray the science that is currently being conducted using the radio spectrum;
- Identify the spectrum requirements necessary to conduct research;
- Identify the anticipated future spectrum requirements for at least the next 10 years; and
- Advise spectrum policy-makers on the value to the nation of accommodating scientific uses of the spectrum, recognizing the need to balance multiple communities.

The committee will comment on the spectrum use by the relevant scientific communities but will not make recommendations on the allocation of specific frequencies.

Spectrum Study Membership

Members

- Marshall Cohen, co-chair, Caltech
- Albin Gasiewski, co-chair, U. Colorado
- Donald Backer, UC-Berkeley
- Roberta Balstad, Columbia
- Steven Ellingson, Virginia Tech
- Darrel Emerson, NRAO
- Aaron Evans, Stonybrook University
- Joel Johnson, Ohio State (consultant)
- Paul Kolodzy, Kolodzy Consulting
- David Kunkee, Aerospace Corp.
- Molly Macauley, Resources for the Future
- James Moran, Harvard-Smithsonian CfA
- Lee Mundy, U. Maryland
- Timothy Pearson, Caltech
- Christopher Ruf, U. Michigan
- Alan Tanner, JPL
- Frederick Solheim, Radiometrics Corp.
- David Staelin, MIT

- = remote sensing
- = radio astronomy
- = policy

Staff: Brian Dewhurst and David Lang, BPA

Yesterday's IGARSS Town Hall Meeting*

- The task of the U.S. NRC Spectrum Study Committee
- Committee membership
- Issues faces remote sensing in the coming years
- Open Discussion

* With grateful thanks to IEEE-GRSS



URSI 2008 General Assembly Session

- URSI 2008 General Assembly: August 10-16, Chicago
- URSI Commissions J (radio astronomy) and F (remote sensing) are hosting a session on "RFI: problems and solutions"
 - ⇒ Co-organizers are S. Ellingson (J) and J. Johnson (F)
- 10 slots for presentations have been allocated
- Deadline for submissions in January 31, 2008
- Please let me know if you are interested in participating in this session



Activities February 2007-July 2007

- **IGARSS 2007**

- ⇒ **FARS Session Organized: Wednesday PM**
 - 8 papers received on spectrum management (2) & RFI mitigation (6)
- ⇒ **Committee meeting held following session**
- ⇒ **Assisted with organization of 1/2 session on disaster management**
 - Thursday PM
- ⇒ **FARS membership supported “town hall” meeting of a US National Research Council (NRC) Report on Frequency Management**
 - Tuesday PM
- ⇒ **Half Day Workshop HD-1 on frequency management cancelled due to low enrollment**



Activities February 2007-July 2007

- Preparing for GRSS representation at next Space Frequency Coordinating Group meeting (SFCG-27)
 - ⇒ 9-27 September, 2007, Maspalomas, Spain
 - ⇒ GRSS will be represented by FARS member Adriano Camps
 - ⇒ FARS/GRSS input discussed in IGARSS committee meeting
 - ⇒ Agenda information for SFCG meeting at <http://www.sfcgonline.org/meetings/events/27/default.aspx>
- FARS member technical input provided to ITU-D Study Group 2 Q22.2 on Disaster Management
 - ⇒ Study group is developing a report to document benefits of remote sensing for disaster management
 - ⇒ Effort seeks to build political support among ITU-D sector (developing nations) for frequency protection
 - ⇒ Building support for disaster management is a key political tool among many organizations



Activities February 2007-July 2007

- FARS members participating (and co-chairing) in a US National Research Council (NRC) panel on "A survey of scientific uses of the radio spectrum"
 - ⇒ Goal is to provide a document that will influence US policy makers
 - ⇒ Panel includes both Earth sensing and radio astronomy researchers
 - ⇒ 6/18 panel members are FARS members
 - ⇒ Committee's first meeting was June 12th.
 - ⇒ "Town hall" meeting Tuesday PM at IGARSS, as well as other conferences
- FARS members co-chairing a joint J/F session at the 2008 URSI general assembly on "Radio frequency interference: problems and solutions"
- Efforts to build connection to GEO task AR-06-11 (chair Philippe Tristant, Meteo France) on frequency management currently in progress



Activities February 2007-July 2007

- FARS member organization of and participation in the Third NOAA passive sensing workshop
 - ⇒ May 1-2, 2007, Silver Spring, MD, USA
 - ⇒ Gathered spectrum managers and remote sensing scientists to discuss requirements for passive sensing
 - ⇒ Reaffirmed results obtained from two preceding workshops
 - ⇒ Work session on frequency allocations above 275 GHz, incl. identification of specific bands for remote sensing use
 - ⇒ Six FARS members in attendance
- Other activities:
 - ⇒ Off-site web site maintained to organize FARS related documents
 - linked to GRSS FARS site, will integrate into GRSS FARS site in future
 - ⇒ One new member joined during this reporting period