

International Cooperation

EMBRACE Program

Brazil

INPE – Space Weather Program

EMBRACE - Participation through International Organizations

- **ILWS** Contributing Agencies and Delegates: Dr. W.Gonzalez
- **ISWI**: Participation through events (instruments indirect)
- **VARSITE**: participation through events
- **WMO**: Participation through ICTSW-membership and EMBRACE products.
- **ICAO**: Participation through discussions under ICTSW-WMO teleconferences and meetings.
- **COPUOS**: (Committee on the Peaceful Uses of Outer Space) Participation through events
- **ISES**: Member since 2009

EMBRACE inside ISWI

CALLISTO
MAGDAS
SAVINET
RENOIR
SCINDA
SID



EMBRACE - Cooperation through Instruments and modeling

- **NOOA**: Downlink in Brazil and data bank COSMIC 1 and 2, GOES 13, and others
 - **Shinshu University** (Dr.K.Munakata): (GMDN - Global Muon Detector Network)
 - **NSSC**: Signed MoU for EMBRACE cooperation in the Chinese Meridian Project.
 - **Boston College, Stanford University and ICEA**: Ionosphere effects over GBAS (Ground Based Augmentation System).
 - **Thales-Allenia Space**: Ionospheric effects over SBAS in cooperation with proposal for H2020.
 - **Jaxa**: GNSS receivers, one at São José dos Campos/SP and the other at Probably Porto Seguro/BA.
 - **Boston College**: LISN (Low-latitude ionospheric sensor network): : GNSS network (actually 20 receivers) and one digital ionosonde VIPIR at São Gabriel da Cachoeira/AM.
 - **RAMSAC, IGS** – GNSS network
 - **UTD** (university of Texas at Dallas) for the operation of a VHF coherent radar to study the ionospheric irregularities.
 - **FC-UDELAR** (Uruguay) – Research and Magnetometers
 - **UNT** (Argentina) – Research and Magnetometers
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- **Future Global Cooperation**: Van Allen Probes, MoU under discussion between **INPE/NASA** for tracking (meeting this month at EMBRACE)

EMBRACE - Suggestions

- The cooperation with many countries has been achieved but most of time the transference of equipment is a complex matter due to the clearance. It would be of a good help we it can count on some support from the UN office for outer space affairs.
- About the many international initiatives we at EMBRACE program (INPE) participate on many of them and we see progress in many areas such as integration of many groups working on space weather (getting together), creation of a data bank of instruments, some standardization etc. However, we want to point that the many organizations with some equal initiatives may weakens cooperation introducing too many opportunities instead of strengthen the existent ones. We have to seek for an organization that concentrates the responsibility (UN expert group ???) for the coordination of the many opportunities.
- New initiatives should be stimulated to join others whenever is possible.
- The leader organization has to incorporate the responsibility to receive, unify and disseminate proposals among the members of the consortium.
- Foment open data police
- The OSCAR database in WMO is a good example of worldwide service for the Space Weather centers to join and standardize their data.

Following the Sun

- The main suggestion for an international cooperation in Space Weather Prediction is a [Virtual Warning Center](#) (we may call it [FOLLOWING THE SUN](#)). More than a place to see the forecast is a place to brief the analysis for the forecast. As the world is naturally 24/7 by default the Warning Centers can post their initial analyses in a server one after the other. As a “task management” to control the timelines and the flux of information we suggest the Ticket-management tool in general used by IT teams.
- Any forecaster will consult the site before issuing his bulletin.
- There are technics to help the follow up of the actions taken. For example, the task management tool called ticket management is suitable because one can give priorities for the task and a timeframe for it.

Questions

- 1. What do we want to accomplish through international cooperation?
In general we seek for cooperation for two reasons:
 - 1) share of new instrumentation (for the procurement and/or operation and/or installation site);
 - 2) Discussion of results, methods, data bank, services of data exchange, etc.Existent organizations are important in that matter.
- 2. Can our goals be accomplished through the existing organizations/relationships, or is a new or different approach needed?
 - The goals can be accomplished through the existing organizations/relationships. But some criteria should be used to administrate the organizations/relationships in order to help understanding the type of attention demanded by those organizations/relationships.
 - Many organizations with equal initiatives may weakens cooperation introducing too many opportunities instead of strengthen the existent ones. We have to seek for an organization that concentrates the responsibility for the coordination of the many opportunities. For example, ISES can become UN/World Space Weather Organization.