

Short presentation of a project proposal for the 5th call Space in FP7

„Wide-band Investigations of Electromagnetic Field in Space“

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Selected draft call topic the proposal aims at

Activity 9.2 Strengthening the foundations of
Space science and technology (SSF)

Area 9.2.2 Research to support space
transportation and key technologies

**SPA.2012.1.3-01 Key technologies enabling
observations in and from space**

Short outline / Proposal concept I

Idea:

- **Better understanding of processes in ionosphere and magnetosphere**
- **Investigations of auroral zones**
- **Disturbances of electromagnetic fields caused by seismic activity, human activity and natural disasters**
- **Development of equipment and sensors for measurement of the electric fields in wide frequency range.**



Short outline / Proposal concept II

- **Gathering of satellite data reflecting the current state of the electromagnetic field in order to supplement available models**
- **Provide clear picture of processes into ionosphere over seismically active zones human activity and natural disasters.**
- **Compare newly obtained data with similar ones from EU-funded projects**
- **Provide possibilities for technological research and cooperation between academia and SME**



Short outline / Proposal concept III

- Development, manufacture and participation in deployment in satellite devices for measurements electromagnetic fields in ULF/ELF/VHF/ and HF bands
- Clarifying of methods and technical means for monitoring of earthquake precursor of signals to studying the volcanic activity. Definition of technical parameters of proposed and new development equipment.
- Participation in deployment of the network functioning, carrying out of continuous observations, data collection and preliminary data analysis.
- Participation in software development for the ground and satellite data complex analysis.
- Developed equipment and sensors for measurement of the electrical fields in wide frequency range (DC-1MHz) for international project RESONANCE.



Consortium I

- **Coordinator: Dr. Boycho Boychev,**
SSTRI-BAS, Head of EM Laboratory.
 - Electrical engendering
 - Space measurement systems
 - Data processing
- Dr., Georgi Sotirov, SSTRI-BAS
 - Communications
 - System integration
- Boris Hotinov, SSTRI-BAS
 - Data processing
 - Software
- Alexander Tatsov, Atcom Ltd. Sofia
 - Ground – base measurement systems,
 - Mechanical constructions

Consultants and cooperation

- Dr. Mikhail Mofilevsky, SRI-RAS, Russia
- Dr. Vitaly Chmyrev, IPE-RAS, Russia
- Dr. Gennady Belyaev ITMIRWP-RAS,(IZMIRAN) Russia



Consortium II

➤ Partners' competences:

1. Instrumentation design;
2. Sensors design
3. Navigation systems and operational services;
4. Environmental modelling;
5. National and local authorities.



Contact and further information

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References:

1. Boychev B. V., Mogilevsky M. M., Yanovsky M. I., Isaev N. V., Boychev V. B., An Instrument And Sensors For Wide Frequency Range Measurements Of The Electric Fields For Resonance Project, International Conference "Fundamental Space Research", Sunny Beach, September 21-28, 2008, Conference Proceedings pp. 443-446, ISBN 978-954-322-316-9
2. Boytchev B., D. Teodosiev, Measurement Equipment for Quasi-Static and Alternating Low-Frequency Electric Fields in Earth-Surrounding Plasma, *Aerospace Research in Bulgaria*, Vol. 19, 2005, pp. 95-106.
3. Berthelier, J.J., Godefroy, M., Leblanc, F., Malingre, M., Menvielle, M., Lagoutte, D., Brochot, J. Y., Colin, F., Elie, F., Legendre, C., Zamora, P., Benoist, D., Chapuist, Y., Artru, J., Pfaff, R., 2006, ICE, the electric field experiment on DEMETER, *Planetary and Space Science*, Volume 54, Issue 5, p. 456-471.
4. Ergun R. E., Carlson C. W., Mozer F. S., Delory G. T., McFadden J. P., Pankow D., Abiad R., Harley P., Wilkes R., Primbsch H., Elphic R., Strangeway R., Pfaff R., Cattell C. A., 2001, The FAST satellite fields instrument, *Space Sci. Rev.*, 98, 67-91.