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**REFERENCE: Short Term Scientific Mission, COST P-18**

**Beneficiary:** Mr YUVAL REUVENI, TEL-AVIV UNIVERSITY

**Host:** Dr. Jyrki Manninen and Prof. Tauno Turunen, SGO, University of Oulu,  
Finland

**Period:** from 22.09.2006 to 06.10 2006 Place: Sodankyla (FI)

**Reference Code:** COST-STSM-P18-02158

## Scientific Report

### 1. Purpose of the visit

The first aim of the Sort Term Scientific Mission was to attend the 2<sup>nd</sup> VERSIM Workshop 2006, which was an international meeting on VLF phenomena and related research. This unique and prestige workshop gathered all the world's specialists in the ELF/VLF research, especially in two main topics which relate directly to my PhD research- waves propagation in the earth-ionosphere waveguide, sprites and the effects of lighting on the ionosphere. The second objective was to spend some time with the SGO VLF research group in order to get close look at research done by them, what kind of instrument they are using for their measurements (broad band & narrow band), the advantage and disadvantage of both way, calibration process for different type of instruments, the different types of approaches and techniques regarding the ELF-VLF data-processing measurements and the implantations on the Ionosphere D region electron density and the effects of sprites & lightning on the Ionosphere. Furthermore, the last purpose was to hear about the research done on the relation between VLF measurements and earthquake events.

### 2. Description of the work carried out during the visit

- Sharing of our experience concerning the LWPCv21 model.
- Extensive discussion about the implementation of different ionosphere profile as function of X-ray flare events, and the comparison to sprite events and their effects on the D-region electron density precipitation in a long wave propagation model.
- Extensive discussion with Dr. Sushil Kumar from Fiji Islands regarding tweaks measurements.
- Extensive discussion with Prof. Tauno Turunen from the SGO VLF group regarding

VLF measurements and data acquisition analysis techniques.

- Extensive discussion with Prof. Michael Rycroft from Cambridge regarding sprites measurements and how I should combine sprites effects on the D-layer electron density precipitation thru modeling and measurements.

### **3. Main results of the visit**

The main goal of this STSM was to get to know all the scientific community which attended this remarkable workshop, hearing and learning new approaches and finding, and all the unknown issues which ought to be explained and investigate. First of all, after talking to Prof. Umran Inan from Stanford University, we have decided that the communication channel between our two research group will be more profound, especially since our current measurement system and the new one which we have just purchased are hand made by Inan's grope, furthermore we have decided that our data acquisition software will be upgraded as soon as our field computer will be connected to an internet line (due to happen in the next few weeks). Also the phase measurements from our broadband data will now be available. Second, after extensive discussion with Prof. Davorka Grubor from Belgrade, Prof. Vida Zigman from Nova Gorica and Dr. Desanka Sulic from Belgrade a profound understanding has been achieved regarding the long wave propagation capability model and its use with the D-layer electron density precipitation research which is relevant to my research. Third, a possible collaboration with Dr. Sushil Kumar from Fiji Islands, in the subject of VLF tweaks measurement and the relation the propagation modes in the earth-ionosphere wave guide has begun.

### **4. Future collaboration with host institution**

SGO is the coordinator of one EU project called as LAPBIAT (Lapland Atmosphere-Biosphere project). That project belongs to FWP6. It allows research groups from Europe to propose their research trips to some (or several) research institute in Finnish Lapland. The project consists of seven research stations (SGO, Meteorological station, 4 Biological stations, and Forest Research Institute).

European groups can apply their project to be accepted to LAPBIAT. Accepted groups get traveling costs, accommodation during their visit, and daily allowance paid by LAPBIAT.

Due to that a research proposal for the second LAPBIAT will be submitted.