

Memorandum of understanding

between

AGILE mission, PI – Tavani Marco (INAF/IASF –Roma, hereinafter AGILE)

and

RELEC mission (Relativistic ELECTron Precipitation and TLE Study), PI – Panasyuk M.I. , Skobeltsyn Institute of Nuclear Physics, Moscow State University by M.V. Lomonosov (hereinafter SINP MSU)

Given as an outcome of the meeting that took place on November 25th 2014 at INAF/IASF-Bologna, located via Gobetti 101, I-40129 Bologna, Italy

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Common interest

Researchers from both missions have a long history of space exploration. In view of the common interest of studying transient atmospheric events, like Terrestrial Gamma Flashes, (TGFs) and Transient Luminous Events (TLEs) in a complementary energy ranges using on-board instruments of AGILE and RELEC missions, we are proposing a joint analysis of transient events by both missions, during time periods while satellites passing equatorial region have separation less than 2000 km from each other. Analysis of such events can be done independently in both collaborations, as well, as jointly. Such combined analysis of the event, is planned if any of transients of TGF, or TLE type will happen in the time period of the equatorial region passage by AGILE and RELEC missions. In addition, cross correlation studies are foreseen, that will require the exchange of photon lists between both teams, to enhance chances to unveil faint events.

Points of contact

- SINP MSU point of contact: Anatoly Iyudin (SINP, MSU)
- AGILE point of contact: Martino Marisaldi (INAF/IASF-Bologna)

Advantages of a collaboration

Analysis of atmospheric transient events are usually hampered by the not sufficient complementary data on the atmospheric and magnetospheric conditions during the time of the transient. Addition of the data collected by AGILE and by RELEC instruments will cover broader energy range of the event itself, while RELEC instruments that detect low frequency and radio frequency electromagnetic waves will provide additional valuable information on the level of magnetospheric activity, and plasma condition during transient event. Making joint analysis with the use of near Earth plasma data and of ground based data may allow us to overcome limitations related to the large number of unknown parameters, which one has to take into account in order to exclude unrealistic interpretations of the event cause and origin.

The collaborative work will be focused in two areas: data analysis for the transient events observed by both missions, and on simulations of such events. Analysis can be made independently, in parallel, in both collaborations and results can be compared.