ASKING SETI LEAGUE MEMBERS TO JOIN IN THE "RLI EXPERIMENT"

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Abstract. The RLI (acronym for "Radiometro Lunare Italiano") is a space radiometer made in Italy that should soon orbit around the Moon aboard the first American commercial space mission to the Moon, TransOrbital's "Trailblazer": web site http://www.transorbital.net/TB2k1_C.html.

The task of the RLI instrument is to measure the attenuation of the Radio Frequency Interference (RFI) man-made on the surface of the Earth but shielded behind the Moon's spherical body.

In essence, the RLI will work in two different bands: the SHF band and the triple ULF-ELF-VLF band:

1) SHF band, more precisely the bandwidth in between 10.7 and 11.8 GHz. The RLI will do a radiometric measurement of the "total power" emitted by both European and (in part) American television satellites orbiting the Earth along the geostationary orbit. The signal integration will be performed by a series of suitable electronic devices. A huge difference of about 100 dB or more is expected to be measured in the total power between the time when the RLI will be facing the Earth and the time when it will be inside the Quiet Cone. A precise measurement of this kind was never made before (except possibly by secret military spacecraft). It will pave the way to the future Lunar Farside Radio Lab Project, already studied by C. Maccone for the International Academy of Astronautics (IAA).
2) ULF-ELF-VLF band, more precisely the bandwidth in between 10 Hz and 10 kHz. These radiometric measurements will give a better understanding of the phenomena of the very thin Moon atmosphere. The relevant receiver will have a direct amplification and a low noise, characterized by a well-defined band-pass. A variety of mathematical transforms (FFT, KLT, wavelets etc.) are hopefully being implemented to do spectral analysis by virtue of either the on-board or the on-the-ground computer. The antenna utilized in this frequency bandwidth will be made by a solenoid having a suitably insulated and shielded ferrite core.

This paper is an invitation to all SETI League Members to point their antennas towards the Moon where the RLI is expected to measure the radio attenuation. Technical details about this Earth-Moon radio experiment will be explained for the first time in this paper by virtue of the RLI. In particular, use will be made of the RLI Simulator, a fine computer code conceived and created by Salvatore Pluchino of the RLI Team. Salvatore was supported in part by other RLI Team Members: mainly by Domenico Caliendo, Luca Derosa, Davide Bruzzi and Dario Kubler, and, to a lesser extent, by Flavio Falcinelli and Claudio Maccone.