Abstract Submission

Intended Topic: The wider context – Engineering – New technologies/Applications – Missions **Preferred type of contribution:** oral

METRIC: a compact mission concept for upper atmosphere mapping, fundamental physics and geodesy

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Abstract

We describe here a mission concept – called METRIC (Measurement of EnvironmenTal and Relativistic In-orbit preCessions) – for a compact spacecraft to be placed in a low Earth orbit, with dedicated instrumentation to provide data useful for atmospheric science, fundamental physics and geodesy. The main scientific objectives are: map the atmospheric density by in-situ acceleration measurement and by spacecraft tracking at altitudes of great interest for satellites deorbiting; perform fundamental physics tests through a precise orbit determination and verification of the equation of motion for a well-characterized test mass; provide an additional, space-based, node to improve the tie among different space geodesy techniques. These three areas being distinct but strongly interrelated in the case of Earth System science, it appears that they can benefit from the availability of a well-calibrated space-based platform such as the one being proposed. Following a discussion of the scientific objectives, the mission idea will be described with a baseline for spacecraft configuration, scientific instruments and data analysis strategies, with a discussion of current outlook.