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Active Magnetic Experiment: a magnetic bubble in the ionospheric stream ALESSANDRO BIANCALANI, FRANCESCO CECCHERINI, FRANCESCO PEGORARO, University of Pisa — A space plasma experiment is discussed which consists of a magnetized plasma bubble interacting with the ionospheric plasma. The magnetized plasma inside the magnetized bubble is tied to the dipole magnetic field generated inside the satellite. The parameters of the bubble are discussed in relation to the parameters of the ambient plasma and the plasma phenomena that can be investigated are indicated. The requirements on the plasma and the (earth orbiting) satellite parameters for the interaction between the satellite and the ionospheric-magnetospheric plasma to be "collective" are examined. The miniaturization of the obstacle from a planet magnetosphere to a satellite magnetosphere leads to plasma regimes that are characterized by very different dimensionless numbers. Although a physically significant scaling of the magnetosphere solar- wind interaction may not be possible important information about the nonlinear dynamics of collisionless plasmas can be obtained by a relatively simple, satellite-based experiment involving a magnetized plasma bubble tied by a dipole magnetic field generated inside the satellite.

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