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ISA accelerometer: fundamental support for the exploration of planet Mercury

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The development of BepiColombo mission is proceeding, in view of the launch, foreseen for 2014. This mission will perform a thorough study of the planet Mercury and its environment. An important set of scientific objectives is constituted by the so–called Radio Science Experiments (RSE), which will study the gravitational field and rotation of the planet, and will perform very precise tests of general relativity theory. In order to reach the required level of accuracy in recovering the relevant parameters, the data coming from the high–sensitivity ISA (Italian Spring Accelerometer) instrument onboard the Mercury Planetary Orbiter (MPO) will be used: this will be the first time for a deep–space probe.

Following a brief description of the mission and RSE, the instrument and its wide capabilities will be reviewed. The focus will be in particular on the updated error budget, operational procedures and extended use of the instrument in the various parts of the RSE. It will be also described the procedure for on–ground calibration of the accelerometer.