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MERMAG: The Magnetic Field Investigation for the BepiColombo Mercury Planetary Orbiter

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Mercury's magnetic field, discovered by Mariner 10 in 1974-75, was one of the main results of that pioneering mission. The full and detailed modelling of the internal field is required to understand its origin in the context of the planet's evolution and the present state of its interior. The objective of the MERMAG investigation is to provide the measurements that are needed to understand the structure of the internal magnetic field. The challenge of the measurements is to identify the contribution of the internal field in the context of the external magnetic fields generated in the small and highly dynamic hermean magnetosphere. The instrument consists of two triaxial fluxgate magnetometer (FGM) sensors with their supporting electronics unit. The excellent performance of the FGM sensors to be used is known from previous missions, Cassini and Double Star. The additional technical challenges that arise from operating such an instrument in the harsh Mercury environment onboard the BepiColombo MPO are well understood; solutions to these will be outlined in this talk. The proposed data analysis techniques to determine the terms of the internal field will also be described. It is expected that a close collaboration with the MMO team and the joint analysis of the magnetic field data from BepiColombo's two orbiters will greatly enhance the capabilities of the investigation to contribute to the scientific objectives of the mission.