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The Magnetometer on the Psyche mission

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The asteroid (16) Psyche is the target of the NASA Psyche mission, where the magnetometer is one of the three science instruments on board. Its purpose is to prove whether the asteroid formed from the core of a differentiated planetesimal. The magnetometer will measure the magnetic field at different distances from the asteroid in order to detect any remanent magnetization, where a magnetic moment larger than 2×10^{14} Am² could imply that the body once generated a core dynamo, and therefore formed as an igneous differentiation.

The Psyche spacecraft carries two three-axis fluxgate magnetometers mounted on a fixed boom at 2.15m and 1.45m, respectively, which provide redundancy and gradiometer capabilities to compensate for spacecraft-generated magnetic fields. The magnetometers will be powered on early in the initial checkout phase and remain on throughout cruise and orbital operations and producing 50 vectors per second. The in-flight temperature of the magnetometers is expected to span a large range, therefore an extensive calibration program has been carried out in order to characterize the instruments and prove the performance pre-flight.