



Determination of magnetometer offsets using mirror mode observations

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Magnetometers onboard spacecraft require regular inflight calibration activities, in particular to determine their outputs in vanishing ambient magnetic fields: the so-called magnetometer offsets. These offset (apart from the spin plane offsets of magnetometers mounted on spin-stabilized spacecraft) may be determined by analyzing Alfvénic magnetic field fluctuations, present in the pristine solar wind, or by cross-calibration with data from other instruments, if available. We present a novel, complementary method, by which these offsets are obtained from mirror mode observations: the mirror mode method. The method takes advantage of the compressional character of mirror modes so that the maximum variance in the magnetic field nearly coincides with its average direction. We apply the mirror mode method to measurements from THEMIS, MMS, and Rosetta and find that highly accurate results with uncertainties on the order of a few tenths of a nanotesla may be achieved.