

Fluxgate vector magnetometers: Compensated multi-sensor devices for ground, UAV and airborne magnetic survey for various application in near surface geophysics

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Fluxgate 3-components magnetometer is the kind of magnetometer which offers the lightest weight and lowest power consumption for the measurement of the intensity of the magnetic field.

Moreover, vector measurements make it the only kind of magnetometer allowing compensation of magnetic perturbations due to the equipment carried with it. Unfortunately, Fluxgate magnetometers are quite uncommon in near surface geophysics due to the difficulty to calibrate them precisely. The recent advances in calibration of the sensors and magnetic compensation of the devices from a simple process on the field led Institut de Physique du Globe de Strasbourg to develop instruments for georeferenced magnetic measurements at different scales - from submetric measurements on the ground to aircraft-conducted acquisition through the wide range offered by unmanned aerial vehicles (UAVs) - with a precision in the order of 1 nT. Such equipment is used for different kind of application: structural geology, pipes and UXO detection, archaeology.