Alternative configurations for fluxgate magnetometers with amorphous cores [Configurações alternativas para magnetômetros "fluxgate" com núcleo amorfo]

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Abstract: Fluxgate magnetometers are widely used in weak magnetic field measurements, mainly for purposes associated with geomagnetic observations, mineral prospecting and space research, because of their low power consumption, low noise level, large dynamic band and great sensitivity, Recent applications of soft magnetism In amorphous alloys have created a renewed stimulus to advance research In magnetic sensors, for deployment in tropical and sub tropical regions resembling Brazil, In the present study, ring cores made of amorphous ribbons are used to investigate the behavior of alternative fluxgate configurations to be introduced In the next generation of magnetometers to be developed at INPE for geomagnetic soundings, The results show the potential of temperature compensations In the fluxgate by the use of a modified feedback circuit, which provides, at the same time, the magnetic field feedback and the required magnetic field compensation due to temperature variations, The study of a direct-driven excitation provided by an amorphous tape-wrapped ring core provides support for a 2nd harmonic magnetometer with sensitivity characteristics similar to those obtained with a conventional excitation, yet operated with less power consumption.

Author Keywords: Direct excitation; Fluxgate; Geomagnetic soundings; Magnetometers

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