FPGA implementation of a tuned fluxgate magnetometer for space applications

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Digital detection can have significant size, weight and power advantages over ana-
logue equivalent fluxgate magnetometer designs. We describe digital detection tech-
niques for a tuned sensor and present first results of an FPGA implementation. The
magnetometer performance is assessed with regard to noise, linearity and temperature
stability and its transfer function is compared to that of the state of the art analogue
design. Parameters affecting the magnetometer range and resolution are discussed in
relation to the scientific requirements of the Kua Fu and Solar Orbiter missions upon
which a flight implementation of the design is proposed.