Digital SQUID Magnetometer Development for Geophysics Applications Validated in Low-Noise Environment

Pascal Febvre

IMEP-LAHC, CNRS UMR 5130, Université de Savoie, 73376 Le Bourget du Lac Cedex, France
Email Pascal.Febvre@univ-savoie.fr

Abstract– A prototype digital version of the widely-used Superconducting Quantum Interference Device (SQUID) magnetometer has been tested in real conditions of operation in July 2007 in the low-noise underground facility of Rustrel France (Laboratoire Souterrain à Bas Bruit, LSBB). Geophysical studies that require a high-magnetic-field dynamic range can benefit from this digital device that makes use of the Rapid Single-Flux-Quantum (RSFQ) technique to achieve fast on-chip electronic feedback at cryogenic temperature. First measurements have shown that the on-chip digital processing of sensor signals, benefiting of all the advantages of digital technique, is a viable solution at cryogenic temperature.

Received June 24, 2008. Accepted July 12, 2008. Reference number ST37; Category 4. Based on a talk presented at the Microcooler Workshop of the "S-Pulse" EU Project, April 2008.