

Improvements in Signal-to-Noise Ratio for SQUID microscope

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We have been developing scanning SQUID (superconducting quantum interference device) microscope for geological samples. In this presentation, we will demonstrate improvements in our scanning SQUID microscope system. We introduce external magnetic shielding by thin shield film outside of a double-layered PC permalloy magnetic shield box surrounding scanning SQUID microscope. We also develop internal magnetic shield just outside of scanning SQUID microscope with five layered shield film for AC and DC shielding. With this set-up, we also introduce a reference SQUID sensor inside liquid helium dewar in order to compensate noise originated from environmental magnetic field. Resulting signal-to-noise ratio is going to be analyzed and reported. In addition, we show a calibration procedure for our scanning SQUID microscope in terms of its sensitivity and deviation from vertical axis.

Keywords: scanning SQUID microscope, noise, magnetic shielding, signal-to-noise ratio, calibration