

Detection of a Moving Object by Multi-channel SQUID Magnetometer System

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We have constructed a multi-channel SQUID magnetometer system for localization and classification of magnetic targets. Ten SQUID magnetometers were arranged to measure 5 independent components of 3 x 3 magnetic field gradient tensor. To get gradient from the difference of magnetic field measurements, we carefully balanced magnetometers. SQUIDs with slotted washer were used for operation in unshielded laboratory environment, and noise characteristic of the laboratory was measured. With the multi-channel SQUID magnetometer system, we have successfully traced the motion of a bar magnet moving around it at a distance of about 1 m. In urban environment, the drift of uniform magnetic field due to the irregular motion of a large magnetic body at distance and earth field causes an error in the position calculation, and this results in the distortion of the calculated trajectory. In this paper, we present the architecture and the performance of the system.

keywords : SQUID, multi-channel, magnetometer, gradient