Tohoku Univ. Technology

Magnetic sensor and its measurement circuit

Highly sensitive and wide range magnetic sensors

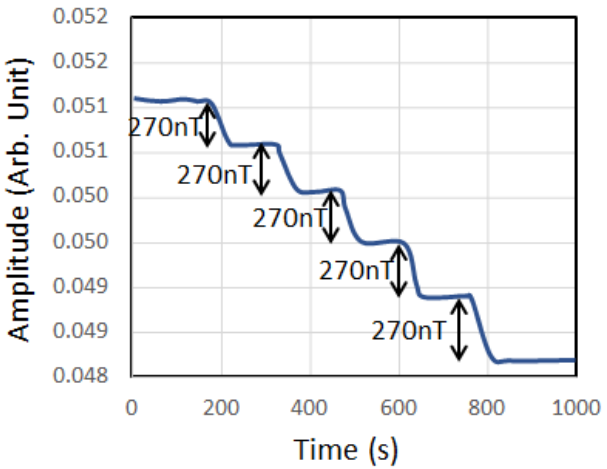
【 For those who see this document 】
Since it is a seed for unpublished patents, it is possible to disclose the description after the conclusion of the IP contract.

Overview

Magnetic sensors with wide dynamic range and high sensitivity have been developed. Various types of sensors, such as SQUID magnetometers and Hall sensors, have been used. Cantilever-type magnetic sensors using mechanical resonant frequency have especially attracted attention because of their low power consumption, small size, and potential for wide dynamic range. However, while they exhibit high sensitivity near the resonance frequency, there is an issue that sensitivity and resolution are not sufficient for magnetic fields below the resonance frequency including DC magnetic fields.

The present invention relates to a cantilever-type magnetic sensor. The sensitivity and bandwidth can be adjusted electrically by introducing a magnetic excitation component. This enables high sensitivity and wide-band magnetic field detection.

Response of the magnetic sensor



As the DC external magnetic field is increased, the oscillation amplitude decreases (the phase increases (not shown)), as can be seen from the step-like response.

Product Application

- Magnetic sensor
- Magnetic flaw detection device
- Biomagnetism measuring apparatus

Related Works

[1] Zhao, Z., Toda, M., Ono, T., Highly sensitive magnetic sensor using magnetic torque, Proceedings of the Symposium on Sensor Micromachines and Applied Systems, Nov 2023.

IP Data

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