

Development of a Tri-axial Magneto-optical Probe for Measuring Magnetic Fields in the Low-frequency Bands

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When measuring low-frequency magnetic fields related to rolling stock, multiple sensors are needed. Therefore, we developed a system that uses a tri-axial magneto-optical probe to measure magnetic fields. This probe is capable of wideband measurement, which enables measurement with a single device. A mechanism was constructed by incorporating optical elements, etc. to detect magnetic fields in a direction 90 degrees that is different from that of conventional single-axial magneto-optical probes. These were then combined to create a tri-axial probe. We confirmed through performance verification tests that using a low noise laser in the low-frequency band as the light source significantly improves the noise characteristics below 100 Hz.