

**Improvement of the Sensitivity to Temperature
of Optical Fiber Sensor at Cryogenic Temperature**

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We are developing a technique to measure the temperature by making use of an optical fiber sensor inside the superconducting magnet adopting high-T_c superconducting wire. It is possible to measure the temperatures at multiple points by one optical fiber, instead of setting the conventional temperature sensors at each measuring point. Also, the optical fiber sensor is suitable for measuring the temperature inside the cryogenic equipment because of the merits of low heat invasion into it and high voltage insulation. In order to develop the optical fiber temperature sensor which can measure the temperature with high precision at cryogenic temperature and under vibration and magnetic field, we carried out various experiments, such as improvement of the sensitivity to temperature using zinc-plated coating and the durability test by mechanical vibration, the operation check of TDM (Time Division Multiplexing) type, the fabrication of low-cost zinc-plated optical fiber.