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Development of an affix-type multipoint pressure sensor by use of FBG -1st Report: Pressure measurement system and the performance-

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Summary: An affix-type multipoint pressure sensor was developed by using the Fiber Bragg Grating (FBG) technology. The FBG technology is commonly used in optical communications and is being applied to the stress/strain measurement of a large structure recently. In this paper, the developed pressure sensor by use of FBG and the pressure measurement system are described. The FBG pressure sensor can be stuck on the surface of a body on which pressures will be measured, and is capable of the temperature compensation by using an FBG temperature sensor. The material and diameter of the diaphragm of the sensor and the pre-tension of the fiber were determined according to the pressure measurement test under static pressures. Pressure distributions on a circular cylinder in uniform flow were measured in a circular water channel, where pressures were also measured by a conventional strain-gauge type pressure sensor. Comparing the measured pressures, performances of the FBG pressure sensor are discussed.

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