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Optical based Cryo-compatible long range displacement sensor

Content :

It is essential to measure the shrinkage/ expansion of the magnets during its operation. Also positioning/ aligning of the magnets can play a vital role in some experiments. So a displacement sensor that can work under extreme environmental conditions is needed to measure the displacement of the magnets. Fiber Bragg grating (FBG) have been considered as excellent sensor elements, as it appears to be useful for a variety of applications. In this paper, a Fiber Bragg Grating sensor is designed according to the requirement of maximum stroke of 500 mm with 1 mm accuracy over the complete stroke range. For achieving the specifications of the sensor, a signal transducing sensitivity part of the sensor was designed, and the fiber was then attached on the surface with a two component adhesive. A study of strain transmission of surface bonded FBG was conducted. The influence of bonding thickness and the bonding length was reported. The design and its performance of the long range displacement sensor were reported.

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