Distributed Fiber Optic Sensors Assisted Prestressing Force Monitoring In Cables

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Distributed fiber optic sensing technology can be good candidate for automatically monitoring cable forces which are critical in the operation of many engineering structures. The present study aims to monitor the prestressing force in cables by distributed fiber optic sensors (DFOS). The installation methods (straight and twisted) for DFOS bonded to prestressing cables by using a two-part epoxy are compared. Also, the initial defect (i.e., crack) effect on the crack influencing length along the cable is investigated by the unique distributed strain data by DFOS. Also, the strain transfer of the twisted DFOS bonded by the epoxy is analyzed based on the mechanics principles, especially at the high load. Also, the initial crack effect on the strain transfer is discussed.