

Fiber Optic Grating Anchor Bolt Stress Monitoring

Preview

This paper proposes a new approach to detecting bolts' anchoring qualities based on the fiber Bragg grating sensing principle. A fiber-optic monitoring test platform of anchor bolt. Abstract: Glass fiber-reinforced polymer (GFRP) bolts have been widely used in some applications of grouted anchors because of the advantages of better resistance to corrosion, high strength-to-weight ratio, low electromagnetic properties, and so on. Continuous dynamic monitoring of the internal force distribution in a high-precision roadway bolt support structure. Geotechnical monitoring of anchors provides fundamental data for analysis and evaluation to ensure safe environment. The Bragg grating chain is connected and embedded into the anchor rod, which solves the problems that the surface-mounted grating anchor rod cannot be reused and is easily affected by the environment, and has the.

Request PDF | A hydraulic fiber Bragg grating force sensor and its monitoring system for axial bolt load measurement in anchorage engineering | The bolt support is one of the most important

Monitoring bolt load using fiber optic sensors stands out as a highly relevant technological alternative for torque control.

It utilizes removable and reusable fiber Bragg-grating sensor(s) embedded in a bolt shaft for preload and retained clamp-ing force measurements.

A bolt fiber Bragg grating (FBG) stress sensor is developed based on FBG sensor technology, providing a data-driven analysis tool for monitoring the bolt stress in the working face.

This paper proposes a new approach to detecting bolts' anchoring qualities based on the fiber Bragg grating sensing principle. Moreover, it studies the strain transmission mechanism between the

This paper presents our recent application of Brillouin-based optical fiber sensors for geotechnical monitoring. We embed an optical fiber into a prestressing steel strand (hereafter "strand") during the

To realize the real-time monitoring of the long-term working state of cable and ensure the safe operation during its service life, Swedish scholars have proposed the idea of intelligent anchor

The performance of the bolt under pull-out loading was measured using the pulse-pre-pump Brillouin optical time domain analysis (PPP-BOTDA)

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In this study, we embedded a fiber Bragg grating (FBG) sensor into a bolt and experimentally examined whether the wavelength in the FBG changes in response to small

As an emerging monitoring technology, fiber optic rock bolts offer exceptional resistance to interference, are compact and lightweight, and can monitor the stress state of rock bolts in real time

In conclusion, the FBG sensors can monitor the dynamic stress state of the bolts and anchor cables in the roadway and provide automatic data acquisition and real-time on-line monitoring.

This study presents a field test to assess the feasibility of fiber Bragg grating (FBG) sensors in monitoring the stress profile of GFRP anchors during pulling test. Two GFRP anchors were fully

This article deals with anchor tests instrumented with FBG deformation gauges of the root and the tendon of the pre-stressed strand anchor in a test field in the Central Bohemian Region.

The field test results indicate that the embedded FBG technology was feasible to monitor the stress state of GFRP anchors during pulling. Glass fiber-reinforced polymer (GFRP) bolts have been widely used

This new self-sensing fiber optic anchor was first applied to an open TBM tunneling project in an inclined shaft in the Kekegai coal mine, and

Therefore, it is very important to monitor the load level of the rock bolts. In this short communication, we propose a smart anchor plate, a simple but effective device that uses fiber Bragg

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