

격자형 구조물의 외부 진동 주파수 탐지를 위한 분포형 광섬유 센서 설계 및 실험

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Detection of excited vibration frequency on the latticed fence structure using a distributed fiber optic sensor

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Key Words : Fiber optic sensor, Sagnac interferometer, latticed fence structure, Frequency spectrum

Abstract : To detect external vibration signals on the latticed fence structure, distributed fiber optic sensor using Sagnac interferometer was fabricated and tested. The latticed structure fabricated with dimension of 170cm in width and 180cm in height, the optical fiber, 50m in length, distributed and fixed on the latticed structure. It was verified the sensitivity of the Sagnac interferometer using the PZT phase modulator. Fiber-optic external vibration signal applied to the latticed structure from 100Hz to several kHz. The interferometric fiber optic sensor detected the excited vibration signal very effectively without any signal processing. The detected optical signals were compared and analyzed to the detected accelerometer signals.

체인-스프라켓 메커니즘을 갖는 에스컬레이터에서 기어박스 백래시로 인한 이상진동에 관한 연구

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A study on vibration characteristics caused by backlash of gear-box in escalator with chain-sprocket drive mechanism

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Key Words : 에스컬레이터, 체인-스프라켓, 기어박스, 백래시, 구동체인, 모델링, 승차감

Abstract : This paper presents an improved escalator dynamic model so as to reflect the experimental observation on the pseudo-resonance affected by load applied. The experimental evidence reveals that backlash of gearbox as well as sag of driving chain are most critical factors to the pseudo-resonance in escalators. The dynamic model effectively reflects vibration characteristics measured in real escalators with respect to different conditions of driving chain and the number of passengers. For validation of the dynamic model developed, numerical results from the model are compared with experimental results. The developed model and its simulation results are used rigorously for the design of escalator systems in enhancing the ride comfort.