와전류 제동장치 설계검증을 위한 동역학적 해석

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Dynamic analysis of eddy current brake system for design evaluation

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Key Words : 동적거동(Dynamic behavior), 와전류 제동장치(eddy current brake system),
       궤도 불규칙(track irregularity), 차륜-레일 단면(wheel-rail profile), 제동력(braking force)

Abstract : In this paper, the results of an analysis of the dynamic behavior of the eddy current brake(ECB) system are presented.   The measured irregularity of the track in Korean high speed line and the track irregularity given by ERRI(high level) were used for simulation.   The wheel-rail profile combination were analyzed with different rail gauges.   A model of the bogie with an substitute body for the carbody was implemented in the Multi-Body-Simulation Program Simpack.   The ECB frame was modelled both as flexible body and as rigid body.   Four different driving conditions were analysed. In this study dynamic behavior in general were performed to evaluate the design of eddy current brake system and specially the effect of damper was also studied.   A comparison of simulations with and without damper shows that the damper have most effect for lower speed.   The simulation results will be verified by comparison with measured data from on line test and also used for improving design.

신경망이론을 적용한 엔진룸내의 냉각팬 소음 최적화 연구

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Noise Optimization of the Cooling Fan in an Engine Room by using Neural Network

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Key Words : Fan noise, Fan system, Free-wake method, Neural network, Optimization

Abstract :Axial fans are widely used in heavy machines due to their ability to produce high flow rate for cooling of engines. At the same time, the noise generated by these fans causes one of the most serious problems. This work is concerned with the low noise technique of discrete frequency noise. To calculate the unsteady resultant force over the fan blade in an unsymmetric engine room, Time-Marching Free-Wake Method is used. From the calculations of unsteady force on fan blades, noise signal of an engine cooling fan is calculated by using an acoustic similarity law. Noise optimization is obtained from Neural Network which is constructed based on the calculated flow rate and noise spectrum.