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고속철도의 실내 음질평가와 음질인덱스 개발

Sound Quality Evaluation and Development of Sound Quality Index for High-Speed Train Interior

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Key Words : interior noise(실내소음), psychoacoustics(심리음향학), high-speed train(고속철도), sound quality index(음질인덱스), Zwicker parameter(Zwicker 파라미터)

ABSTRACT

Complaints against high-speed train interior noise have been increasing as a number of high-speed train passenger grows bigger. It is very difficult to analyze characteristics of high-speed train interior noise using sound pressure level only. It is requested to consider how the public response change for each high-speed train interior noise. This study presents evaluation of the sound quality for interior noise of KTX-II using Zwicker parameters. Characteristic of loudness and sharpness is different between noise samples depending on operation condition. The noise sample that recorded when the high-speed train passed through tunnel section is more louder and sharper.

후 기

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참 고 문 헌

(1) E. Zwicker, H. Fastl, 1999, “Psychoacoustics Facts and Models”.

(2) Jang. K. J, Park. J, 2009, “Sound Quality Analysis og a High Speed Trains Using Zwicker model”

(3) Kook. J.H, Jung. E.J, Kim. J.S, 2006, “Sound Quality Evaluation of Plumbling Noise using Zwicker Parameter”.

(4) Seo-Il Chang, 2008, “Jury Evaluation Test for Annoyance Response of KTX(Kores Train Express) and Odrdinary Train Noise”.

(5) Sonoko Kuwano, Seiichiro Namba, Takehisa Okamoto, 2004, “Psychological evaluation of sound environment in a compartment of a high-speed train”, Jounal of Sound and Vibration 277(2004) 491-500.

(6) Oh. J. E, Park. S. G, 2006, “Construction of Sound Quality Index for the Vehicle HVAC System Using Regression Model and Neural Network Model”, Preceedings of the Korean Society of Noise and Vibration Engineering Conference.

(7) Mutsumi Ishibashi, Anna Peis, Fumiaki Satoh, Hideki Tachibana, 2006, “Relationships between arithmetic averages of sound pressure level calculated in octave bands and Zwicker’s loudness level”, Applied Acoustics 67(2006) 720-730.

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