iv2splus INFONET

Verkehrsinfrastruktur, VIF2012

BEGEL

Bewertung des akustischen Einflusses von Gleisbögen für die Erstellung von Lärmkarten

The high frequency noise emitted by railway vehicles in tight track curves is a considerable annoyance for local residents. When it comes to noise modelling and planning such effects are not included up to now. The goal of this study is to investigate the acoustic correlation of curve noise, to determine correction factors and implement them in state of the art calculation models.
In order to define these influencing factors in-situ measurements at selected measurement sites on track curves with different parameters will be performed.
When selecting the measurement sites the following parameters will be considered:
? radius of the curve: the lower the curve radius, the higher are the forces that affect the rail increasing the chance of curve-squealing.
? superelevation of the track: a superelevation in line with the driving speed can improve the track behaviour of trains
? parameters of the superstructure(track decay rate, type of sleeper/rail, rail pad, etc.)
? rail roughness: the higher the acoustic roughness of the rail the higher the noise emitted by the rail/wheel contact.
? friction modifier: with the use of rail lubrication systems the curve squealing can be prevented.
The measurements will be carried out with the acoustic monitoring system acramos®, which detects every pass-by train automatically and records the acoustic parameters, the rail vibration, the speed, the category of the train (passenger train, freight train, etc.) as well as the metrological situation. With the resulting data the
? average a-weighted pass-by noise level,
? he average linear octave and 3rd octave spectra,
? the vertical and lateral track decay rate and
? the length related sound power level LW? according to ÖNORM S5026
will be calculated.
In addition, historical measurement data of respective partners, under consideration of the prevailed parameters, are taken into account to determine correction factors. With the results of the measurements, frequency dependent correction factors will be derived and implemented in the standardized calculation model for sound propagation programs.
The effects of curve squealing, as well as the dependency of the influencing factor (radius of the curve, friction modifier, train category, etc.), is simulated and compared to public literature.
The outcomes of the project BEGEL should be the basic for an implementation in the ONR 305011 so the annoyance of curve-squealing can be taken into account in future noise abatement planning.

program line

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Project coordination

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