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Study on characteristics of a crashworthy high-speed train nose

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Abstract

The external shape of a high-speed train nose is usually designed according to the aerodynamic considerations and to minimise the drag forces and noises. Crashworthiness of the nose is another aspect that is important from the passive-safety point of view. To improve the crashworthiness characteristics, usually there are not many options for changing the external shape of a high-speed train nose; therefore, a systematic study has been conducted to examine possible strategies in order to design crashworthy external and internal structures for a high-speed train nose. It is observed that the longer and slender noses show better crashworthiness characteristics. In addition, various multi-layer noses are studied, and the best internal-layer geometry is proposed. At the last step the effects of foam usage in different spaces between internal and external layers of the nose are shown.

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Keywords

- high-speed train,
- nose,
- crashworthiness,

- external and internal structures,
- foam

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