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**Numerical and analytical models for high speed train pantograph
radiated noise prediction**

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The present work deals with the development and comparison of an analytical and numerical models for the evaluation of the noise radiated from a pantograph of an high speed train.

Under the numerical point of view, a simplified model has been developed for the pantograph; the model that substructures the problem approaching a complex structure as a combination of simple components, has been derived from a similar aeronautical problem (landing gear noise) but has been self- modified to adapt the formulation to the specific problem. The output of the model is the radiated noise level and spectra as a function of the pantograph speed.

The CFD numerical model has been developed for the pantograph based upon a commercial code; only the upper part of the system has been herein simulated because it was addressed as the main noise source during previous laboratory acoustic tests. As an output of the model, the radiated noise has been derived with special reference to two main speed to which experimental data could be referred. Analytical and numerical results will be within the paper discussed and compared to highlight the single approach's advantage and drawbacks. At the and of the paper, some line experimental results will be also introduced and discussed.