



Railway bridge dynamics: development of a new high-speed train load model for dynamic analyses of train crossing

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Abstract

In 2019, the German Federal Railway Authority commissioned the consortium TU Darmstadt, KU Leuven, AIT-Austrian Institute of Technology and REVOTEC to develop a new dynamic load model for high-speed railway bridges. It aims to cover the envelopes of the dynamic train signatures and acceleration responses for all currently operating trains and the current HSLM (high-speed load model), given in the Eurocode. In addition, the development of the new load model should also include possible configurations of fast freight trains and future train configurations. An overview of the planned content of the research project and selected results of the current work will be presented.

Keywords: railway bridges; train crossing; high-speed-load-models; train signature; acceleration response spectrum.

1 Introduction

Railway bridges are excited to forced vibrations during train crossing, which may lead to a

destabilization of the ballast layer. Thus, instability of the rail position may occur, eventually leading to safety issues for trains and passengers, respectively. During the design process of new