Die Graduiertenschule MUSiC mit dem IRTG 1627 lädt ein zum Vortrag:

“Wheel–rail interaction on heavy–haul applications: new contact models and geometric profiles optimization of rails”

January 23, 2018 – 03.00 p.m.
Graduiertenschule MUSiC, Appelstr. 11A
MUSiC Seminar room 5th floor
Room A 501

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Wheel–rail interaction represents a topic of great engineering interest, particularly in the context of heavy–haul applications. Many practical problems such as wear, rolling contact fatigue, occurrence of plastic strains, impacts, noise, corrugation and others are subject of many practical research, where many opened questions remain.

This lecture will introduce an ongoing project, which objective is to better understand and create numerical models for wheel–rail contact mechanics. Particularly, we are interested in two main topics: (i) simulation of vehicles, by developing and using rigid and flexible multibody dynamics tools. In such context, software GIRAFFE (developed at USP) is being employed with novel master–master contact models. These models are being adapted for the context of wheel–rail contact (ii) optimization of wheel–rail geometry. Here a methodology of fast simulations to address critical variables, such as contact pressure, derailment possibilities, wear and others is being developed to obtain best–performance geometric profiles for a given scenario of straight/curved track, with given conditions of vehicle travel.

The main questions we are studying and methodologies being employed are going to be discussed in the lecture.

This research project is a cooperation between Vale S.A. and University of São Paulo. Practical results may be directly employed in real railways located in Brazil (Carajás and Vitória–Minas railways).