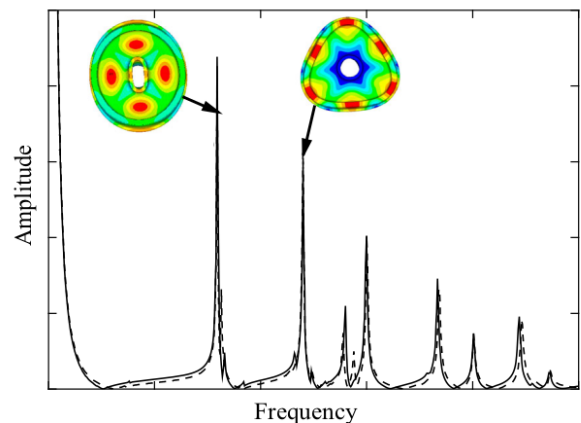
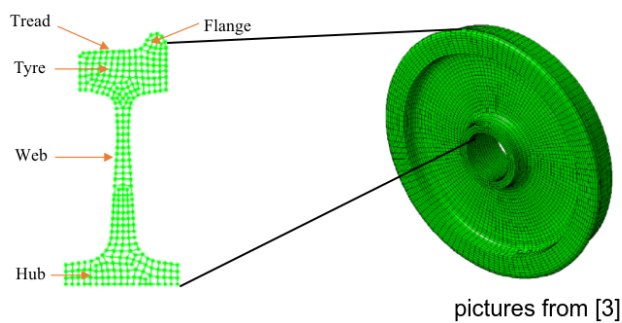


## Railway Noise and Vibration

In order to cope with the rapidly growing traffic of the future and at the same time to achieve the ambitious climate protection goals, the Federal Government is relying on the railways. The goal is to double passenger numbers by 2025 and shift more goods from road to rail. In this context, noise protection and the associated acceptance of the railroad among the population play a significant role: "The highest priority for us is noise protection at source, to dampen noise where it originates."

When operating rail vehicles, there are many causes for the generation of noise. This includes contact and friction between the wheel and rail, especially when cornering, braking, rough rails or wheelset profiles, vibrations due to rotating machine components, flat spots on wheelsets, and much more. Because rail vehicles are predominantly made of steel, the vibrations generated during operation and the structure-borne noise caused are transmitted almost undamped and passed on to the environment as airborne noise—the wheelsets in particular act like large drums.



The project's aim is the development and experimental validation of a passive acoustic damper for wheelsets in rail vehicles. For example, we consider the model wheelset with a rolling axle of a Laaeks 553 standard freight wagon for car transport. For this wheelset, a numerical model for the calculation of the acoustic structural behavior should be created and calibrated with acoustic and structural dynamic measurement data. A damping polymer coating is then applied to the rear of the wheelset to reduce noise. The optimal material and geometric properties of such a damping coating are examined using a numerical model and then validated on the test stand. This noise-reducing measure should be particularly suitable for upgrading freight and passenger cars that are already running.

### Literature:

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