

## Material parameters for the mechanical modal analysis of hydrogenerators

The magnetically-induced vibration in electrical machines is one important topic of interest since undesirable effects can be associated to it, such as possible damages, life span reduction and consequent audible noise. For an accurate prediction of the machine vibration it is mandatory to employ mechanical models with the actual material parameters of the stator core. In the particular case of Hydrogenerators, where the stator is composed of stacked thin laminations grouped in packs and separated by ventilation ducts, taking into account these effects for such a large structure in time-cost effective manner is a real challenge.

The present work proposes to extract the equivalent material properties based on experiments performed on a prototyped stator core sector. The measured eigenfrequencies are used to calibrate the mechanical model and, consequently, extract the desired material parameters.

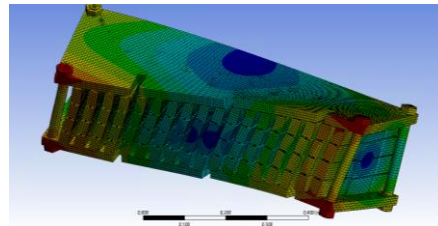


Fig. 1: Stator sector prototype



The main activities are:

- Literature review about stator core material parameters.
- Familiarization with FE mechanical modal analysis using Ansys Workbench.
- Creation of a mechanical model in Ansys for the prototyped stator sector
- Perform measurements (experimental modal analysis) on the prototype in the laboratory for different clamping pressures and number of air ducts.
- Apply parameter fitting techniques for the calibration of the calculation models.

### Forschungsschwerpunkt:

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Maschinenentwurf	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Praktische Tätigkeit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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