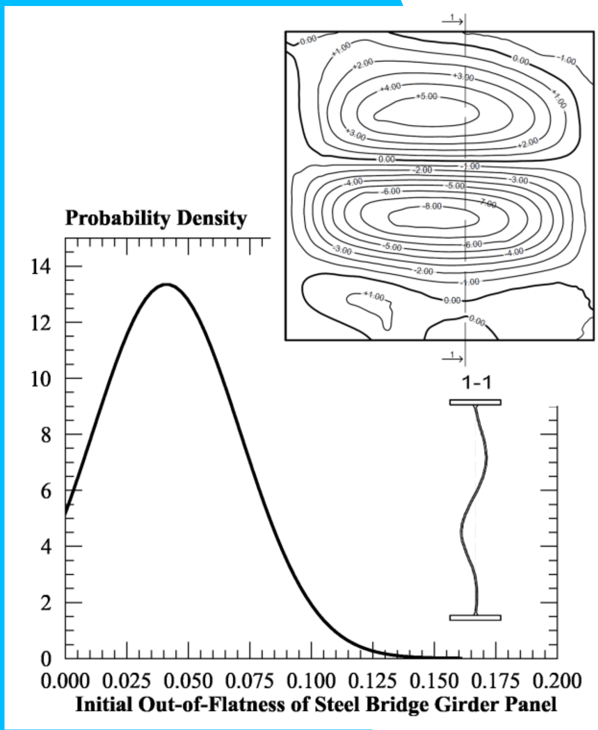
Universität Stuttgart
Institut für Konstruktion und Entwurf

Analysis of Measured Imperfections of Thin-Walled Steel Bridge Girders

Bachelor thesis

In the context of preserving and retrofitting existing steel structures, precise recalculation methods are essential. However, thin-walled steel components often exhibit imperfections that exceed current manufacturing tolerances, making the application of Eurocode-based design methods problematic. To support the development of buckling analysis, a detailed understanding of geometrical imperfections observed in practice is essential.

The aim of this thesis is to analyse geometrical imperfection measurement data from existing steel bridge girders and classify these into generic imperfection forms.



The key tasks:

- Review of existing literature and standards on imperfections and manufacturing tolerances in thin-walled steel structures
- Analysis and classification of imperfection measurement data from bridge inspections and laboratory sources
- Identification of key parameters for imperfection characterisation
- Development of a typology of imperfection shapes and assignment to generic forms
- Statistical evaluation of imperfection characteristics to derive representative parameters and distributions

Requirements:

- Basic knowledge of structural stability and steel construction
- Interest in Python

Structural Stability

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