

On certain widespread ideas for dimension reduction in structure mechanics

The classic models for thin structures, with names like Euler, D. Bernoulli, Navier, and Kirchhoff, attached, are based on certain a priori assumptions on the deformation and/or stress fields, diverse in nature but all motivated by the smallness of certain dimensions with respect to others.

In the last years, a considerable amount of work has been done in order to rigorously justify these a priori assumptions; in particular, several techniques have been introduced to make the dimension reduction rigorous. In this talk, I review and to some extent reformulate the main common ideas behind these techniques, using some explicit dimension reduction problems to exemplify the points I want to make.

The talk is based on ongoing work with P. Podio-Guidugli.