

# The coupled-mode interface and nested Bloch waves

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**Keywords:** structural interfaces, configurational forces, elastic metamaterials

In this talk we present a model of waves through a structured coupled-mode interface. The latter couples flexural and longitudinal modes of deformation of beams, which reveals several resonance phenomena.

The transmission problem, incorporating an “elastica” type interface, includes analysis of a wave incident on a compressed buckled beam. Both linearised time-harmonic and non-linear transient formulations have been considered. Explicit representations are deduced for the transmission and reflection coefficients and a transmission resonance has been identified.

Furthermore, a periodic structure containing inertial interfaces, which incorporate configurational forces that couple flexural and longitudinal deformation modes, has been considered. A special type of forced wave called “nested wave” is discussed in detail. The solution has been given in a closed analytical form, and resonance phenomena have been identified.

*Acknowledgements:* Support from the ERC Advanced Grant Instabilities and non-local multi-scale modelling of materials 340561-FP7-PEOPLE-IDEAS-ERC-2013-AdG (2014-2019) is gratefully acknowledged.