
Coordinate free formulation of the vibrations of a Reissnerbeam and some mechanical consequences

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Abstract

We start from a coordinate free model of a Reissner beam with 6 d.o.f. at each section. The dynamic model is brought back to a partial differential equation in the Lie algebra of the Lie group of Euclidean displacements. A coordinate free linearization with respect to any equilibrium position is done and some interesting results about proper modes are highlighted in the framework of linear elasticity. These calculations are performed without ever using any frame nor coordinate

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