

## English summaries

Rakenteiden Mekaniikka (Journal of Structural Mechanics)  
Vol. 46, No 3, 2013, pp. 55-69

### On the history of beam bending theory

Timo Saksala

**Summary.** This article presents a brief sketch on the history of beam theory. Scientists who have contributed to the theory are introduced in chronological order starting from Da Vinci and ending to Timoshenko and their improvements are shortly explained. The emphasis is on the contributions, not on the person.

*Key words:* Euler-Bernoulli beam theory, beam bending, history of structural mechanics

Rakenteiden Mekaniikka (Journal of Structural Mechanics)  
Vol. 46, No 3, 2013, pp. 70-90

### An overview to the micropolar continuum model

Reijo Kouhia

**Summary.** One generalized continuum model is the micropolar, also known as Cosserat continuum model. In this model every point of the continuum is equipped in addition to the standard displacement degrees of freedom also with rotations, which describe the behaviour of materials microstructure. Six material parameters are needed for linearly elastic isotropic polar continuum. For conformally invariant curvature state the number of material parameters is reduced to four. Also for the restricted polar continuum model, known as the theory of moment stresses, the number of independent material constants is four. In this article some characteristic features and determination of the material parameters for linearly elastic isotropic polar continuum model is examined.

*Key words:* polar continuum model, microstructure, moment stress, force stress, elasticity, isotropy