Oddities in Structural Instabilities

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**Key words:** micro-buckling in metamaterials; tensile buckling of strips, as well as of beam, plate, and shell systems; mode transitions in buckling and post-buckling, unusual instabilities of structures made of auxetic materials.

ABSTRACT

Structural instability appears to be an old-fashioned field of research. However, recently several oddities related to instability phenomena at different length scales have come into focus. For instance, many unusual effects in microstructured materials, i.e. amazing properties of metamaterials, are caused by micro-instabilities. Typically, buckling is related to compression loading; however, there are many configurations of technical structures or biological systems containing structural elements, which undergo or even need instabilities under tensile loading.

Oddities of the mentioned type can be found in technical and natural sensors, in the design of advanced materials, in micro-electro-mechanical systems (MEMS) and in biology (as, e.g., in cell motions).

Submission of abstracts dealing with modelling and computational treatment as well as with applications of such phenomena are most welcome.