

Symposium | A. Advances in Materials Theory for Multiscale Modeling

[SY-A1] Symposium A-1

Chair: Anton Van der Ven(University of California Santa Barbara, United States of America)

2018年10月29日(月) 13:30 ~ 15:00 Room6

[SY-A1]The role of null-lagrangians in the continuum interpolation of the linear chain with hyper-pre-stress

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The simplest discrete one-dimensional model including elastic bulk and surface energy is the linear chain with hyper-pre-stress. It is known that when NN and NNN "geometrically incompatible" interactions are taken into account the qualitative behavior of the chain can fall into three generic cases depending on the ratio of the stiffnesses of the NN and NNN interactions. We adress here the general question of finding an exact continuum interpolant of the discrete solution. Guided by the qualitative aspects of the characteristic equation we chose the Mindlin model is an appropriate candidate. Starting from a general form of the elastic energy in the continuum we show that null-lagrangians are mandatory in order to obtain an exact interpolant.