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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON APPLIED MATHEMATICS

Capillary folding of thin elastic sheets

By

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Abstract

Capillary folding is the process of folding planar objects into three-dimensional (3D) structures using capillary force. We propose a 3D model for the capillary folding of thin elastic sheets with pinned contact lines. The energy of the system consists of interfacial energies between the different phases and the elastic energy of the sheet. The later is given by the nonlinear Koiter's model which allows large deformation of the sheet. From the energy, we derive the governing equations for the static system using a variational approach. We then discuss numerical methods to find equilibrium solutions via a relaxation dynamics. Finally, we present simulation results which are in good agreement with physical experiments and exhibit rich and fully 3D behaviors not captured by previous 2D models.

Date : 26 July 2023 (Wednesday)
Time : 10:00am – 11:00am
Venue : Room 2464 (Lifts 25/26)

All are Welcome!