
Modeling tension development in growing fruits

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Abstract

The talk will introduce the rationale behind mechanical-based modeling in the study of plant morphogenesis and provide an overview of the main capabilities of the in-house developed FEM software MorphoMechanX. Subsequently, the case of explosive seed dispersal in *Cardamine* (an invasive weed) will be explored, showing how the valve of this fruit has developed into an ingenious bio-mechanical device able to rapidly coil to eject the seeds far away. One key factor leading to the explosive coiling is the high tension developed in the epidermal layer of the valve, which, if isolated from the other tissues, would contract longitudinally. Through mechanical modeling supported by experimental observations, the role of cellular growth and material anisotropy in the development of contractility for this layer will be shown.

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