



Self-similarity and intermediate asymptotics on the dynamical impact on PDMS viscoelastic board.

Lecturer:

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Place: Building 6 - Room201



Abstract

Self-similarity is a fundamental concept in physics. In this seminar, I introduce the concept of self-similarity and intermediate asymptotics that were formalized by Barenblatt and show how effective these concepts are to describe and understand the phenomena in soft matter physics in which their behaviors and scaling laws vary depending on the scale of physical parameters.

In this seminar, I will show the experiments of dynamical impact of solid spheres onto viscoelastic boards. Its scaling laws varied at different impact-velocity. I have succeeded in describing a self-similar solution which governs the scaling behaviors completely. The self-similar solution has the dimensionless parameter derived from a solution in elastic regime and an inverse Deborah number. The solution shows that the behaviors are fully determined by the competition between elasticity, viscosity and inertia. It is a typical framework of crossover of scaling law.

