



قطب علمی
سیستم‌های پیچیده
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سمینار هفتگی ماده چگال نرم

Defect dynamics in active nematics

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Topological defects are distinctive signatures of liquid crystals. They profoundly affect the viscoelastic behaviour of the fluid by constraining the orientational structure in a way that inevitably requires global changes not achievable with any set of local deformations. In active nematic liquid crystals, topological defects not only dictate the global structure of the director, but also act as local sources of motion, behaving as self-propelled particles. In this article, we present a detailed analytical and numerical study of the mechanics of topological defects in active nematic liquid crystals.

زمان: شنبه 97/05/27 ساعت 15:30
مکان: تالار جناب (آمفی تئاتر دانشکده فیزیک)