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Summary: We study static and dynamical properties that distinguish 2D crystals constrained to lie on a curved substrate from their flat-space counterparts. A generic mechanism of dislocation unbinding in the presence of varying Gaussian curvature is presented in the context of a model surface amenable to full analytical treatment. We find that glide diffusion of isolated dislocations is suppressed by a binding potential of purely geometrical origin. Finally, the energetics and biased diffusion dynamics of point defects such as vacancies and interstitials are explained in terms of their geometric potential.

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82D25 Statistical mechanical studies of crystals

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