

Condensed Matter Theory Center Seminar



Wednesday, June 24
11:00 am – 12:00 pm
2205 Toll Physics Building

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“Phase Diagram of Step Faceting on a Crystal Surface: Numerical Calculations on a Restricted Solid-on-Solid Model with Point-Contact Type Step-Step Attraction”

The anisotropic surface tension of a vicinal (or slightly tilted) surface based on a solid-on-solid (SOS) model is calculated by a density matrix renormalization group (DMRG) method [1]. The SOS model we calculated is a restricted solid-on-solid (RSOS) model with point-contact-type step-step attraction (p-RSOS model) [2-5]. Here, “restricted” means that the height difference between the neighboring sites is restricted to 0, 1, and -1 . The point-contact-type step-step attraction represents the energy gain which is obtained by forming a bonding state by the orbital-overlap at the meeting point of neighboring steps. The calculated surface tension shows discontinuity in slope dependence at low temperatures [3]. Due to the discontinuity, a step faceting phase [6] and a step droplet phase are formed [2, 3] in addition to the Gruber-Mullins-Pokrovsky-Talapov (GMPT) universal phase [4]. We show a phase diagram of these three phases [5].

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Host: Ted Einstein

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