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Superfluid-Insulator and Roughening Transitions in Domain Walls SEBNEM GUNES SOYLER, BARBARA CAPOGROSSO-SANSONE, NIKOLAY PROKOF'EV, BORIS SVISTUNOV, University of Massachusetts at Amherst — We have investigated superfluid behavior of one and two dimensional interfaces separating solid domains. The system is described by the hard-core Bose-Hubbard Hamiltonian with nearest-neighbor interaction. We present the analysis of superfluid-insulator transition of the interface based on our quantum Monte Carlo simulations. We also show that, in one dimension the transition is accompanied by the roughening transition, driven by proliferation of charge-1/2 quasiparticles.

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