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Optimal loading for a Tonks-Girardeau gas CLAUDIA DE GRANDI, ANATOLI POLKOVNIKOV, Boston University — We analyze the process of loading a one-dimensional system of hard-core bosons, i.e. a Tonks-Girardeau gas, into a commensurate optical lattice. We consider different loading protocols (e.g. linear, quadratic or sudden ramp in time, or cyclic loading). We discuss possible ways of optimization to minimize the heating and the excitations rate of the system due to the loading process. Combining analytical and numerical methods we analyze the problem under experimentally realistic conditions and we compare the results with earlier scaling predictions.

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