

# Spin dynamics in one-dimensional bosonic quantum gases

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It is today possible to realize experimentally ultra-cold quantum bosonic gases in quasi one dimensional geometries, where it is possible to tune the interactions between the atoms and to reach strongly interacting regimes. It is also possible to create spinor gases, where the atoms have two pseudo-spin states, associated with different internal degrees of freedom. We use Quantum Monte Carlo techniques to study ground-state and dynamical spin properties at zero temperature. In particular we investigate the effective mass of a spin impurity[1], the speed of spin waves and the spin-dipole mode.

[1] L. Parisi, S. Giorgini, Phys. Rev. A 95, 023619