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Abstract for an Invited Paper
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**Numerical Methods for Cold Atoms**

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I will discuss merits and practical applications of some numerical methods for simulations of equilibrium finite-temperature properties of cold atomic systems. For bosonic systems without frustration, the methods of choice are the Path-Integral Monte Carlo and Stochastic Series Expansion (with worm-type updates). They allow one to produce accurate results that can be compared to experiments ''as is" not only for standard thermodynamic quantities but also for time-of-flight images and linear response functions. As far as simulations of frustrated systems (spins or bosons with spin-orbit coupling) or interacting fermions at low, but finite, temperature are concerned, I will discuss the status of the Diagrammatic Monte Carlo method and the possibilities it offers for the dual-fermion approach.