ALF - Algorithms for Lattice Fermions

alf.physik.uni-wuerzburg.de – DOI ✓

Algorithms Lattice Fermions

Description

- General code for quantum Monte Carlo simulations
- Flexible, efficient simulation of lattice Hamiltonians
- Generic models, arbitrary lattices and observables

Highlights

- Extensive documentation and support from our team
- Parallel code + near-optimal single-core performance
- Continuous, cutting-edge development

If we had a wish...

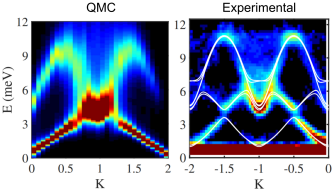
Support, advertise and, above all, use ALF!

$$\hat{\mathcal{H}} = \hat{\mathcal{H}}_T + \hat{\mathcal{H}}_V + \hat{\mathcal{H}}_I + \hat{\mathcal{H}}_{0,I}\,, \text{ where}$$

$$\hat{\mathcal{H}}_T = \sum_{k=1}^{M_k}\sum_{\sigma=1}^{N_{\mathrm{fl}}}\sum_{i=1}^{N_0}\sum_{x,y}^{N_{\mathrm{dim}}} t^{(k)}_{x\sigma,y\sigma}\hat{c}^\dagger_{x\sigma}\hat{c}_{y\sigma} \equiv \sum_{k=1}^{M_k}\hat{T}^{(k)},$$

$$\hat{\mathcal{H}}_V = \sum_{k=1}^{M_l} U_k\left\{\sum_{\sigma=1}^{N_{\mathrm{fl}}}\sum_{i=1}^{N_0}\left[\left(\sum_{x,y}^{N_{\mathrm{dim}}}\hat{c}^\dagger_{x\sigma}V^{(k)}_{x,y}\hat{c}_{y\sigma}\right)+\alpha_{k\sigma}\right]\right\}^2 \equiv \sum_{k=1}^{M_l} U_k\left(\hat{Y}^{(k)}\right)^2,$$

$$\hat{\mathcal{H}}_I = \sum_{k=1}^{M_t}\hat{Z}_k\left(\sum_{\sigma=1}^{N_{\mathrm{fl}}}\sum_{i=1}^{N_0}\sum_{x,y}^{N_{\mathrm{dim}}}\hat{c}^\dagger_{x\sigma}I^{(kx)}_{x,y}\hat{c}_{y\sigma}\right) \equiv \sum_{k=1}^{M_t}\hat{Z}_k\hat{I}^{(k)}.$$



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