

Poster 7

Solving models of high- T_c and dynamically induced superconductivity from the microscopic models

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Computing the properties of even basic systems of repulsively mediated high- T_c or dynamically induced superconductivity from the microscopic model is a highly challenging endeavour. We have recently developed a powerful new framework, combining matrix product states and mean field theory (MPS+MF), that can treat such systems, even in 3D, for unprecedented lattice-sizes, temperatures and time scales for the quasi-one-dimensional (Q1D) class of models [1,2]. This framework can also treat one of the most difficult aspects of many high- T_c models, the close competition between superconducting and insulating states, in an unbiased manner [3].

[1] Gunnar Bollmark, Thomas Köhler, Lorenzo Pizzino, Yiqi Yang, Johannes S. Hofmann, Hao Shi, Shiwei Zhang, Thierry Giamarchi, and Adrian Kantian, *Phys. Rev. X* **13**, 011039, (2023).

[2] Svenja Marten, Gunnar Bollmark, Thomas Köhler, Salvatore R. Manmana, and Adrian Kantian, arXiv:2207.09841 (2022).

[3] Gunnar Bollmark, Thomas Köhler, and Adrian Kantian, arXiv:2301.08116 (2023).