

Abstract Submitted  
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**Superconductivity in organic conductors: ab-initio results from parallel DMRG** ADRIAN KANTIAN, Nordita, KTH Stockholm, MICHELE DOLFI, MATTHIAS TROYER, ETH Zrich, THIERRY GIAMARCHI, Universit de Genve — The U-V model at quarter filling is considered the canonical minimal model to explain unconventional superconductivity in the organic Bechgaard and Fabre salts [1]. Yet it has so far resisted solution to show that it actually can support superconducting order. Here, we use a heavily parallelized version of the density-matrix renormalization group (DMRG) to provide the first ab-initio solutions for the U-V model in the regime suspected to support superconducting order. Our results support the existence of a phase marked by spin-singlet pairing, thus ruling out antiferromagnetic order (the usual close competitor to unconventional superconductivity). In this phase we will extend our analysis by studying the response to explicit bias fields. Our work is complemented by analysis of the two-leg U-V ladder through a combination of DMRG and analytical RG of a bosonized low-energy theory. [1] C. Bourbonnais, D. Jerome, *The Physics of Organic Superconductors and Conductors* (ed. Lebed, A.) pp. 358 (Springer, 2007).

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