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## **Solution to sign problems in particle-hole symmetric spin-less fermion systems.**

*Tuesday, 18 February 2014 17:00 (30 minutes)*

We solve the sign problem in a class of particle-hole symmetric spin-less fermion models using the idea of fermion bags. The solutions emerge in the Hamilton formulation of lattice field theory where time can be continuous. The solution allows us for the first time to explore quantum phase transitions in models with a single four-component Dirac fermion in three dimensions.

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