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Finite volume effects and meson scattering in the 2-flavour Schwinger model

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We investigate the two-flavour Schwinger model in the canonical formulation with fixed fermion number. We use Wilson fermions on the lattice and present a formalism which describes the Dirac operator with dimensionally reduced canonical operators. These reduced operators allow the direct examination of arbitrary meson sectors and the determination of the energy spectrum in each of the sectors. Using Lüscher's finite-volume mass-shift formula we discuss the 1-meson mass as well as the effective 3-meson coupling. From the 2-meson energies we determine the scattering phase shifts and compare the 3-meson energies in the finite volume to predictions based on scattering theory and quantization conditions.

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