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QCD spectroscopy and quark mass renormalisation in external magnetic fields with Wilson fermions

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We study the change of the QCD spectrum of low-lying mesons in the presence of an external magnetic field using Wilson fermions in the quenched approximation. Motivated by qualitative differences observed in the spectra of overlap and Wilson fermions for large magnetic fields, we investigate the dependence of the additive quark mass renormalisation on the magnetic field. To this purpose we derive Ward identities for lattice and continuum QCD+QED from which we can extract the current quark masses. We then compare different strategies of tuning for the quark masses.

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