Localisation and chiral symmetry in 2+1 flavour domain wall QCD

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Abstract: We present results from QCDOC for the dependence of the residual mass on the size of the fifth dimension, and its relation to the density and localisation properties of low eigenvectors of the Hermitian Wilson Dirac operator and the domain wall transfer matrix for 2+1 flavour domain wall QCD using DBW2 and Iwasaki gauge actions. Using ensembles of $16^3 \times 32$ configurations, with an extent of 8 in the fifth dimension for the sea quarks, we demonstrate the existence of a regime where locality, chiral symmetry breaking and topology change can be acceptable for inverse lattice spacings $a^{-1} \geq 1.6$ GeV.