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String breaking with 2+1 dynamical fermions using the stochastic LapH method

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The static potential V(r) between a static quark and a static antiquark separated by a distance r is defined as the energy of the ground state of this system. As a consequence of confinement, the energy between the quark-antiquark pair is contained inside a color flux tube, the so called string. As soon as the energy is high enough, the gluonic string connecting the quarks will break due to pair creation. String breaking is manifested as a quantum-mechanical mixing phenomenon between different states, which contain two infinitely heavy quarks acting as static color sources. We investigate this phenomenon with $N_f = 2 + 1$ flavors of dynamical Wilson fermions in the stochastic LapH framework, using an ensemble of gauge configurations generated through the CLS effort. We see the effect of the third sea-quark flavor, which results in a second mixing-phenomenon due to the formation of a strange-antistrange pair.

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