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$2 + 1$ flavor measurement for η and η' masses using domain wall fermion

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The $\eta - \eta'$ mass splitting coming from anomalous effect on U(1) axial currents has been a historical issue.

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The QCD gauge field topology with instanton can explain this problem and show consistent result with experimental mass of η' .

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Based on the $2 + 1$ flavor lattice QCD simulation, previous $\eta - \eta'$ masses study shows about 15% level of accuracy.

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With the advanced computational capability of GPU, we can process more bigger and finer lattice data for higher precision measurement.

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In this work, we will show our preliminary $\eta - \eta'$ mass result calculated on $24^3 \times 64$ and $32^3 \times 64$ Iwasaki gauge lattices corresponding to $a^{-1} = 1.73\text{GeV}$.

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