Localization of analytic regularity criteria on the vorticity and balance between the vorticity magnitude and coherence of the vorticity direction in the 3D NSE
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In '95 daVaiga has shown that $\|Du\|_q^{\frac{2q}{2q-3}} \in L^1(0,T)$ is a regularity class for the Navier-Stokes Equations for any $3 \leq q < \infty$. Previously, Beale-Kato-Majda proved the regularity when the time-integrability of the L^∞-norm of the vorticity holds. In this talk we will show the localized versions of the afforementioned conditions imply local enstrophy remains bounded. The geometric conditions on the vorticity direction field are important in studying the regularity and the localized version has been recently obtained by Grujic. The special scaling invariant regularity class of weighted L^pL^q type for the vorticity magnitude with the coherence factor as a weight will be demonstrated in a localized setting.