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**Aseel Farhat\*** (af7py@virginia.edu) and **Zoran Grujić**. *Enstrophy cascade and helical nature of turbulence.*

Direct numerical simulations showed that there is a high probability that velocity and vorticity vectors of the flow are nearly aligned in regions of high vorticity. We will show that that 3D NSE are regular under some appropriate local condition on the helicity in the the regions of intense vorticity. Moreover, we will present a rigorous proof of forward cascade of enstrophy, from large scales to small scales in the flow, under the above mentioned local assumption on helicity. (Received September 24, 2017)