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Nan Jiang* (jiangn@mst.edu). *A fractional Laplacian-based closure model for turbulent fluid flows*. Preliminary report.

Nonlocal Models have attracted intensive research interests in recent years due to their ability to model phenomena that can not be correctly described by classical local PDE models. In particular, fractional derivative models have been found to be very effective in modeling anomalous diffusion processes. In this talk, we will present a new closure model based on the fractional Laplacian operator that accounts for the anomalous diffusion that arises in fully-developed turbulent fluid flows. Both theoretical aspect of the turbulence model and the numerical algorithms to implement the model will be discussed. (Received August 24, 2019)