Regularized Slender Body Theory[1] MICHAEL NICHOLAS, RICARDO CORTEZ, Tulane University — Various slender body theories allow for the representation of filaments in Stokes' flow by a distribution of fundamental solutions along the filament center line. The idea is revisited here in the more general setting of regularized forces in a small neighborhood along the center line. The regularity in the forces produces a smooth final expression that helps eliminate the computational instabilities of the unregularized formulas. The derivations of the regular slender body theories corresponding with the standard theories of Lighthill and of Keller and Rubinow are outlined. Consistency with these theories is verified in the limit as the smoothing parameter vanishes. Numerical issues of the resulting theories are addressed in the context of test problems.

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