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Turbulent Drag Reduction by Polymers: A Theoretical Study on the Effect of Polymer Concentration CHUNG YIN LEUNG, EMILY S.C. CHING, The Chinese University of Hong Kong — A recent theory on turbulent drag reduction by polymers in wall-bounded flows, which is based on the balance of momentum and energy, has been developed [I. Procaccia, V.L. L'ov, and R. Benzi, *Rev. Mod. Phys.* **80**, 225 (2008)]. In this theory, the effect of the polymers is understood as a position-dependent effective viscosity. Using this theory, we have carried out a study on the effect of polymer concentration for both flexible and rigid polymers. We have calculated the profiles of the mean velocity and the Reynolds stress and investigated how the profiles change with the polymer concentration. We find some interesting relation between the maximum Reynolds stress and the position of the maximum for a large range of concentration. We have also calculated how the friction factor and the percentage of drag reduction vary with concentration. In this talk, we shall discuss our results and also compare them with experimental observations.

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