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Dynamics of two disks settling in a two-dimensional narrow channel: From periodic motion to vertical chain in Oldroyd-B fluid[1] TSORNG-WHAY PAN, ROLAND GLOWINSKI, Department of Mathematics, University of Houston, Houston, TX — In this talk we present a numerical study of the dynamics of two disks settling in a narrow vertical channel filled with an Oldroyd-B fluid. Two kinds of particle dynamics are obtained: (i) periodic interaction between two disks and (ii) the formation of the chain of two disks. For the periodic interaction of two disks, two different motions are obtained: (a) two disks stay far apart and interact is periodically, which is similar to one of the motions of two disks settling in a narrow channel filled with a Newtonian fluid discussed by Aidun Ding (Phys. Fluids, 15 (2003), 1612) and (b) two disks draft, kiss and break away periodically and the chain is not formed due to not strong enough elastic force. For the formation of two disk chain occurred at higher values of the elasticity number, it is either a tilted chain or a vertical chain. The tilted chain can be obtained for either that the elasticity number is less than the critical value for having the vertical chain or that the Mach number is greater than the critical value for a long body to fall broadside-on, which is consistent with the results for the elliptic particles settling in Oldroyd-B fluids.

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