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Clustering of Attractive Colloids in Flow MING HAN, Northwestern University, JONATHAN K. WHITMER, University of Wisconsin–Madison, ERIK LUIJTEN, Northwestern University — The behavior of colloidal suspensions under flow is important for numerous applications, including direct-write techniques employing "colloidal ink." Here we investigate the behavior of colloids flowing through narrow channels. When colloidal particles experience sufficiently strong attractive interactions, cluster formation and ultimately gelation may result. We employ computer simulations to investigate how the size and structure of these clusters, as well as their distribution in the flow, is influenced by various experimental variables, including flow velocity, attraction strength, fluid viscosity, and channel diameter. These simulations incorporate explicit hydrodynamics through the multiparticle collision dynamics (MPC) algorithm. Particular attention is paid to the role of channel boundaries and to the dimensionless parameters characterizing the suspension.

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