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MR Colloid Self-Assembly in Confined Geometries PATRICK DOYLE, RAMIN HAGHGOOIE, MIT — The characteristic length scales found in microfluidic devices have been shrinking drastically over the past several years. As a result it is becoming increasingly important to study the effects of this tight confinement. We have used the Brownian Dynamics simulation technique to study the self-assembly of magnetorheological (MR) colloids under confinement. To compliment these simulations, we have used particle tracking to study micron-sized colloids assembling in fluidic channels. For quasi-two dimensional systems, we report a seemingly contradictory response of the system to confinement between parallel hard walls. In contrast to previous circular geometries, we see re-entrant melting with respect to changing channel width and not with respect to field strength. As the channel height is increased (in the range of a few particle diameters), we observe oscillations in the mean cluster spacing with respect to gap height. These oscillations and the transition to the large gap scaling regime will be discussed.

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