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Jamming of Brownian disks in a channel with a constriction[1] ALEJANDRO BILBAO, JERZY BLAWZDZIEWICZ, Texas Tech University — We investigate jamming dynamics of an externally driven system of Brownian particles in a two-dimensional channel with an abrupt constriction. Our numerical simulations reveal a rich dynamical behavior that results from an interplay between external driving forces, thermal excitations, and geometrical constraints due to confinement. In particular, we have observed that channel blockage arising from particle accumulation at the constriction entrance alternates with sudden unjamming events originating from thermal fluctuations. We have also found that the dependence of the average particle flux on the channel width is non-monotonic as a result of strong spatial particle-wall correlations. Under some conditions there exist spontaneous particle ordering and dynamic switching between phases with square and hexagonal symmetry. We expect that similar phenomena can be observed in confined granular flows and in suspension flows in microchannels.

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