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**A Deterministic Microfluidic Ratchet** KEVIN LOUTHERBACK, JASON PUCHALLA, ROBERT AUSTIN, JAMES STURM, Princeton University — We present a deterministic microfluidic ratchet where the trajectory of particles in a certain size range is not reversed when the sign of the driving force is reversed. This ratcheting effect is produced by employing triangular rather than the conventionally circular posts in a post array that selectively displaces particles transported through the array. The underlying mechanism of this method is shown to be an asymmetric fluid velocity distribution through the gap between triangular posts that results in different critical particle sizes depending on the direction of the flow.

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