Abstract Submitted
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Design of a Molecular Diode: Nanoratchets[1] ROBERT AUSTIN, JASON PUCHALLA, PETER GALAJDA, KEITH MORTON, Princeton University — We use the concepts hydrodynamic flow in asymmetric structures and apply them to our own asymmetric bump array/diffusion array technology at the nanoscale. Our basic premise is that asymmetrically designed metamaterials at the nanoscale can act, under the influence of externally applied forces, as molecular ratchets which will sort molecules based on their size. At some nano length scale, we believe that the classical concepts of stick boundary conditions break down and a new regime of transport begins. We present computer simulations and experiments which show that at the nanoscale level we can efficiently separate objects the size of proteins.

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