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Continuous Nano-Particle Transport in a Standing Wave Optical Line Trap VASSILI DEMERGIS, ERNST-LUDWIG FLORIN, The University of Texas at Austin — Since the introduction of the single beam optical trap (SBT) by Ashkin et. al. in 1986, trapping and manipulation of micron-sized particles by optical forces has become instrumental in many areas of research. However, controlled transport of large numbers of particles is difficult using a SBT. Here we introduce a technique for controlled transport that we call an Optical Capillary (OC), named for its ability to strongly confine and continuously transport nanometer-sized particles. The OC, generated by an optical standing wave pattern, is especially strong along the optical axis due to the compensation of the axial scattering force. We utilize the lateral scattering forces to control the transport of particles along a line perpendicular to the optical axis. The measured velocity profiles of single particles in the OC agree with our model predictions.

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