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Message in a bottle: the statistical behavior of nanoparticles in optical confinement[1] H. DANIEL OU-YANG, JOSEPH JUNIO, LIANGCHENG ZHOU, Lehigh University — In an aqueous medium, container surfaces can significantly alter the behavior of suspended nanoparticles. We propose a method to investigate nanoparticle behavior in a boundary-free environment by transiently trapping them with a focused laser beam. While optical confined, as in an optical bottle, these particles are affected by both particle-light and particle-particle interactions. Time-averaged fluorescence imaging produces results in 3D mapping of the nanoparticle concentration in the bottle. We report how we analyze the messages in the bottle, i.e. the statistical behavior of these particles, by using the 3D distributions obtained under both controlled optical and interparticle forces.

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