

Utilizing Casimir-Polder Forces of Nanophotonic Structures for Atomic Trapping

Darrick Chang

Institut de Ciències Fotòniques, Spain

Email of Presenting Author: darrick.chang@icfo.es

In recent years there have been successful efforts to interface cold atoms with nanophotonic systems. In such systems, the atoms are located within ~ 100 nm of the dielectric structures, in order to couple efficiently to the optical modes. At these close distances, Casimir-Polder (CP) forces between the atoms and dielectric become significant. Typically, strong CP forces are viewed as problematic, yielding a loss of trap stability as they compete against external optical trapping forces. Here, we discuss various opportunities in which CP forces can be advantageously utilized, to create atomic traps that access novel parameter regimes not possible by conventional trapping techniques.