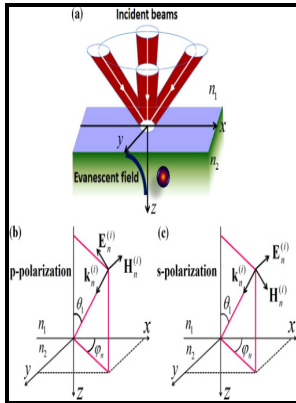


Forces exerted on atoms by a resonant electromagnetic evanescent wave

University of Birmingham - Lateral forces on circularly polarizable particles near a surface



Description: -

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Woodward effect

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Evanescent wave optical trapping and transport of micro

Commonly, two traps are generated by splitting the laser beam into two orthogonally polarized beams. This confirms the presence of the transverse helicity-independent spin AM 8 s y in the evanescent field and its transfer to the particle. When a insert is placed asymmetrically in the cavity, its dielectric properties could result in greater asymmetry, while decreasing the cavity.

Lateral forces on circularly polarizable particles near a surface

The narrow peak corresponds to atoms, which never experience fluctuation of the dipole force in the dressed state model of the reflection process these atoms are always in one particular repulsive dressed state. The same analytical expression can also be deduced by calculating the force between two dipoles and related by the image coefficient S , placed at a distance. The possibility of a net force that acts simultaneously on several particles at different locations within a wide area not requiring focusing of a light beam onto the individual objects , and, in addition, is directed laterally parallel to the substrate and perpendicular to the illumination direction , would enable the mass movement, arrangement and sorting of particles on a substrate or waveguide in a simple way.

ShieldSquare

With acousto-optic deflectors or -driven mirrors, a single laser beam can be shared among hundreds of optical tweezers in the focal plane, or else spread into an extended one-dimensional trap. Optical forces from an evanescent wave on a magnetodielectric small particle.

Lateral forces on circularly polarizable particles near a surface

The peaks to the right correspond to the atoms that were reflected by the evanescent wave. The trap is formed by an evanescent light wave that

supports atoms against gravity, and a hollow beam that provides confinement in the horizontal direction. The first term in the first equation 6 is the gradient force, while the second term is the radiation pressure force.

Evanescent Waves

For a high numerical aperture fiber there is a significant field component in the longitudinal direction, and for small diameter tapers a significant fraction of the optical power resides in the evanescent field outside the fiber. With the aid of the flow of the cells, there is a resultant force that is directed along that preferred optical path. So the list of four has been reduced in a sense to only three.

An electromagnetic mirror for neutral atoms

In 2013, the announced the Exotic Propulsion Initiative, a new project privately funded that aims to replicate Woodward's experiments and then, if proven successful, fully develop exotic propulsion. A from an HG beam emitted by an argon-ion laser. Wolf, Principles of Optics, 7th ed.

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