Application of Multilayer Method in Vortex Beam

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EXTENDED ABSTRACT: The nano-manipulation of the electron beam is a development direction after the micron-scale manipulation of the optical tweezers. In the rotation experiment of the vortex beam on the gold nanoparticles, only the force in the angular direction is required. However, the principle and design requirements of the general electron beam manipulation make an analysis method of the force of the electron beam on the particles urgently needed. On the basis of the multi-layer method, using the mechanism of free propagation between layers in the multi-layer method, through the analysis of the interaction process between the wave and the potential field, the state change of each point on the electron beam in the interlayer is calculated, and the interaction force between the sample and the electron beam at any position in the simulation space is obtained. The simulation of the rotation of gold nanoparticles by repeated vortex beam is analyzed, and there are two aspects of precision advantages. It is expected to become a powerful tool for particle force analysis.

Keywords： Electron vortex beam; Multislice method; Mechanical interaction;

BIOGRAPHY

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