

Fibered nano-optical tweezers

Jochen Fick

Institut Néel, Grenoble, France

jochen.fick@neel.cnrs.fr

Optical tweezers become a standard tool for non-invasive manipulation in many scientific domains such as biochemistry, physics and medicine. In this context, the use of optical fibers attracts increasing attention as highly flexible tools for particle trapping. Fiber-based optical tweezers do not require substrates or bulky high numerical aperture objectives. They provide easy access to the trapped particle, which is useful for the implementation of further manipulation or characterization elements.

Recent results of micro- and nanoparticle trapping with different types of optical fiber tips will be presented. In particular bare and metallized straight fiber tips have been used as well as special nano-antennas with non-Gaussian beam emission. The trapping efficiencies at different light powers and fiber tip-to-tip distances are evaluated by analyzing the experimental data within three different models that find consistent results.

References:

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