



ISTITUTO ITALIANO
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TITLE

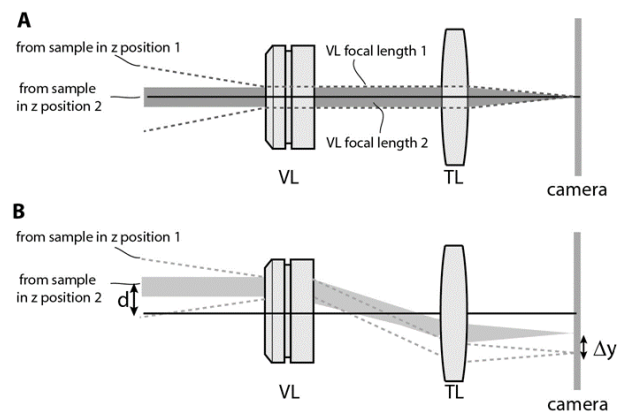
Three-dimensional optical localization of nanometric objects with tunable axial range and localization precision

INVENTORS

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DESCRIPTION

An optical microscopy method that enables the 3D location of species within a sample with high precision and over wide and tunable axial ranges is provided. The present method is based on splitting the detection arm of a microscope into 2 different pathways in combination with a high-speed varifocal lens. The 2 pathways pass through the varifocal lens at different positions, one perfectly aligned (AP) and one slightly decentered with respect to the lens optical axis (DP), and the corresponding images are collected using 2 different cameras or 2 regions within a single camera. From the AP pathway, an extended DOF image is obtained that is used to determine the x-y position of the species. By comparing the AP versus the DP images corresponding to the same species, a quantification of the z position of the different species can also be carried out.



APPLICATIONS

Fluorescence microscopy, wide-field microscopy, particle tracking

KEYWORDS

3D microscopy, localization microscopy, varifocal lens, fast volumetric acquisition

BIBLIOGRAPHIC DATA

Metodo e apparato per il tracciamento ottico di oggetti emettitori.

Application Number IT102017000006925

Priority Date January 23, 2017

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