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Traveling wave tracking of individual molecular motors IRENE DUJOVNE, M. VAN DEN HEUVEL, Kavli Inst. of NanoScience, Delft University of Technology, C. SYMONDS, G. CAPPELLO, Institut Curie, Paris, France, CEES DEKKER, Kavli Inst. of NanoScience, Delft University of Technology — Insight into the mechanisms of motility can be obtained by the study of the movement of motor proteins along biological filaments. Optical tweezer techniques are now able to track the motion of motor proteins with nanometer spatial resolution and 1-10 Hz bandwidth. Recently, G. Cappello developed an optical technique to track the movement of beads with sub-nanometer and microsecond resolution [1]. A unique aspect of this technique, based on total-internal-reflection traveling wave, is that no force is applied on the object under study. In this work we present modifications of this optical technique with the goal of larger scattering intensities that allow shorter acquisition times. Here we present this system to the study of microtubules traveling on kinesin-coated structures. The impact of fabricated nanostructures on the scattering intensities is discussed together with the feasibility of the application of this experimental scheme to the study of DNA-processing enzymes.
1 L. Busoni, A. Dornier, Jean-Louis Viovy, J.Prost, and G. Cappello, J. Appl. Phys. 98, 064302 (2005)

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