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**Differential Dynamic Microscopy: a simple means to measure dynamics with a microscope**

ROBERTO CERBINO, Universita degli Studi di Milano

Optical microscopy is an excellent tool to investigate the structure and dynamics of soft and biological materials. In this contribution we present a novel scheme to measure the dynamics of a system using an ordinary microscope [1]. This scheme is based on the spatial Fourier analysis of a time series of microscopy images, which enables us to study the relaxation of the intensity Fourier components at different spatial frequencies. This quantifies the dynamic activity of the system at different wave-vectors, giving access to information similar to the one obtained in dynamic light scattering experiments. Our technique termed Differential Dynamic Microscopy (DDM) is capable of monitoring the dynamics of both objects that are larger and smaller than the wavelength of light. The remarkable simplicity of DDM makes it suitable for the use in any laboratory that is equipped with an ordinary microscope.

[1] Roberto Cerbino and Veronique Trappe, “Differential Dynamic Microscopy: Probing Wave Vector Dependent Dynamics with a Microscope,” Phys. Rev. Lett. 100, 188102 (2008)