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Differential dynamic optical microscopy for the characterization of soft matter: liquid crystal dynamics, volume phase transition of hydrogels, and phase transition of binary mixtures BEOM-JIN YOON, JUNG OK PARK, MOHAN SRINIVASARAO, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, GA 30332, MICHAEL H. SMITH, L. ANDREW LYON, School of Chemistry and Biochemistry, Georgia Institute of Technology, Atlanta, GA, 30332 — The structure and dynamics of soft matter were studied by differential dynamic optical microscopy. One can retrieve q-space information through image processing and Fourier analysis, even when the feature sizes in real space image are too small to be resolved or even visible in an optical microscope. The temporal sequence of real space images were Fourier transformed, and analyzed for the temporal and spatial fluctuations of power spectrum. Here, we present the results on liquid crystal dynamics and their elastic properties, volume phase transition of hydrogels when their dimensions are sub-micron, and critical opalescence of binary mixtures (water/2,6-lutidine).

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