P.43 All-optical manipulation of photonic membranes

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We use an inverted holographic optical tweezers scheme, as shown in figure 1a), to all-optically manipulate and actuate photonic membranes, with engineered opto-mechnical responses. Photonic membranes based on hybridization of metallic nanofeatures on polymeric substrates have already been shown to make precise, robust and flexible optical filters [1], which can be made compliant to complex shapes, like the tips of optical fibres[2]. This makes them particularly well suited to biophotonics application, due to their precise sensing capabilities and highly flexible nature [3,4]. Optical tweezers are a precise manipulation tool for translating and orienting photonic membranes within biological samples, unlocking intriguing applications.

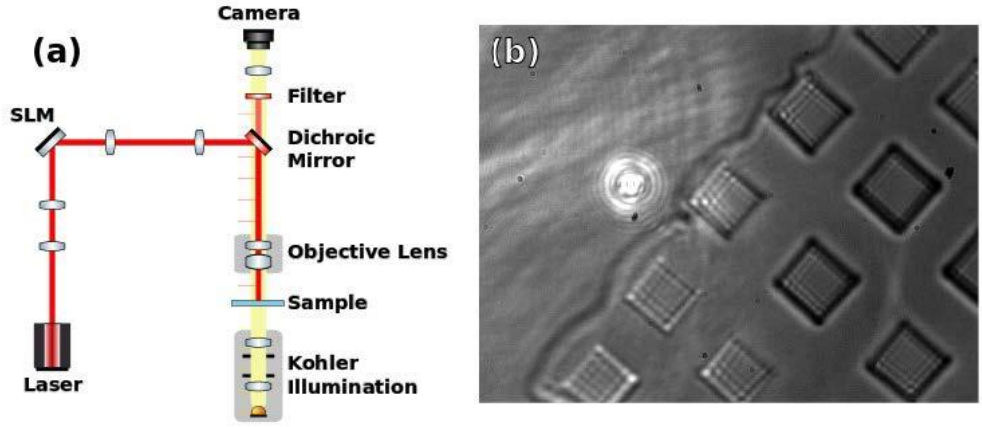

Figure 1a) shows schematic diagram of the inverted optical tweezer scheme used to manipulate extended polymeric membranes like that shown in figure 1b). Membrane show in figure 1b) had side length on the order of 100 μm.

Here we present and discuss preliminary results obtained for the all-optical manipulation of extended (edge length ~ 100 μm) SU8 polymer-based membranes like those shown in figure 1b).

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