Nano-optomechanical Dielectric Metasurfaces Reconfigurable with Light

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We report on the realization of ultrathin free-standing all-dielectric metasurfaces, with sharply resonant optical properties in the near-infrared (telecoms) wavelength range, in which the optical forces generated among constituent elements are sufficient to induce reversible nanoscale structural deformation. With mechanical Eigenfrequencies in the hundreds of megahertz range, the optomechanical response of such structures provides for fast, strongly nonlinear tuning of optical properties at $\mu W/\mu m^2$ intensities.