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Title: Dual polarized near-field focusing plate for nearfield optical focusing in two dimensions

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Abstract: We introduce a dual polarized near-field focusing plate (DP-NFFP) with focusing in two dimensions, designed to operate at the near infrared frequency of 193 THz ($\lambda_0 = 1550$ nm). Subwavelength focusing in two dimensions, for both incident polarizations, is achieved at a distance of a quarter wavelength from the DP-NFFP. The design procedure is described in detail and the proposed design could be easily scaled to other working frequencies, from microwave to optics. We show that the use of ideal lossless (i.e., perfect electric conductor) or real lossy (i.e., silver) metals provide with subwavelength focusing at 193 THz, indicating that metal losses do not significantly affect the DP-NFFP performance, and thus confirming the design feasibility at the near-infrared frequency. Results are validated by using two distinct full-wave simulators.

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