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Tuning the Polarization State of Light over a Broad Frequency Range with Metasurfaces MU WANG, SHANG-CHI JIANG, ZHENG-HAN WANG, XIANG XIONG, RU-WEN PENG, Nanjing University, NANJING UNIVERSITY TEAM — Controlling the polarization state, the transmission direction and the phase of light within a confined space is an important issue in optics. By integrating metallic metastructure and dielectric interlayer, it is possible to realize the dispersion-free broadband device on sub-wavelength scale, where the strong response of the metallic structures helps to decrease the device size while the dielectric interlayer helps to eliminate the dispersion simultaneously in both the amplitude and the phase difference of the reflected/transmitted light. As an examples to apply this concept, a broadband quarter-wave plate and a half-wave plate are experimentally demonstrated. By carefully selecting the structural parameters, the polarization state of light can be freely tuned across a broad frequency range, and all of the polarization states on the Poincar sphere can be realized dispersion free. Some contents of this talk can be found in the following references: [1] S.-C. Jiang, et al., *High-efficiency generation of circularly polarized light via symmetry-induced anomalous reflection,* **Physical Review B** 91, 125421 (2015), [2] S.-C. Jiang, et al., *Controlling the Polarization State of Light with a Dispersion-Free Metastructure*, **Physical Review X** 4, 021026 (2014), [3] X. Xiong, et al., *Metallic stereostructured layer: an approach for broadband polarization state manipulation,* **Applied Physics Letters** 105, 201105 (2014).

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