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Manipulation of the polarization of Terahertz wave in subwavelength regime via hybridizing pseudo-spin polarized graphenes and metal hole array¹ XIAO XIAO, CHE-TING CHAN, WELJIA WEN, Department of Physics, Hong Kong University of Science and Technology — In this presentation, we show that the subwavelength quarter wave plate and half wave plate in terahertz regime can be realized in a metal hole array (MHA) sandwiched by two stacks of pseudo-spin polarized graphenes (PSPGs). When the gaps of the two PSPGs are the same, the hybrid resonances in the system can convert the linearly polarized incident light into the circularly polarized transmitted light; On the other hand, when the gaps of the two PSPGs are opposite in sign, the polarization of the reflected light can be rotated by 90° . Interestingly, when the PSPGs is tuned in the quantum Hall regime, the fine structure constant can relate with the resonant frequency and the geometrical parameters of MHA directly. The rich properties of the system guarantee its potential applications in THz technologies.

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