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Brewster angle phenomenon in two-dimensional metallic photonic crystals and its application to polarization beam splitting XINHUA HU, KAI-MING HO, Ames Laboratory and Department of Physics and Astronomy, Iowa State University, Ames, Iowa 50011 — The authors show the Brewster angle phenomenon of p waves in two-dimensional metallic photonic crystals of rectangular lattices with effective medium theory and accurate multiple-scattering calculations. The Brewster angle can be tuned over a wide range by varying the structure parameters. Based on this phenomenon, the authors propose a polarization beam splitter which can completely separate the p and s waves at an incident angle of $45^\circ \pm 10^\circ$ in a very wide wavelength range (1~500 micron).

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