Polarization-Sensitive Broadband Metamaterial Absorber Based on Plasmonic Bilayer Nanostructure Array for Potential Applications in Polarization Photodetection

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Drude-Lorentz model:

$$\hat{\epsilon}_r(\omega)=1-\frac{\Omega_p^2}{\omega(\omega-i\Gamma_0)}+\sum_{j=1}^{k}\frac{f_j\omega_p^2}{(\omega_j^2-\omega^2)+i\omega\Gamma_j} \quad (S1)$$

Relative parameters of metals Al and Ti are listed in the following table S1：

Parameters	Al	Ti
ω_p	14.98 eV	7.29 eV
f_0	0.523	0.148
Γ_0	0.047 eV	0.082 eV
f_1	0.227	0.899
Γ_1	0.333 eV	2.276 eV
ω_1	0.162 eV	0.777 eV
f_2	0.050	0.393
Γ_2	0.312 eV	2.518 eV
ω_2	1.544 eV	1.545 eV
f_3	0.166	0.187
Γ_3	1.351 eV	1.663 eV
ω_3	1.808 eV	2.509 eV
f_4	0.030	0.001
Γ_4	3.382 eV	1.762 eV
ω_4	3.473 eV	19.43 eV
Applicable frequency range	4.84×10^{15}-1.209×10^{12} Hz	1.209×10^{15}-9.677×10^{12} Hz

The Drude-Lorentz model shown in Eq. S1 is available for the wavelength range of 500-2000 nm. And the refractive index (n, k) curves of metals Al and Ti calculated using the Drude-Lorentz model within the wavelength range of our work (500-2000 nm) are plotted as below：

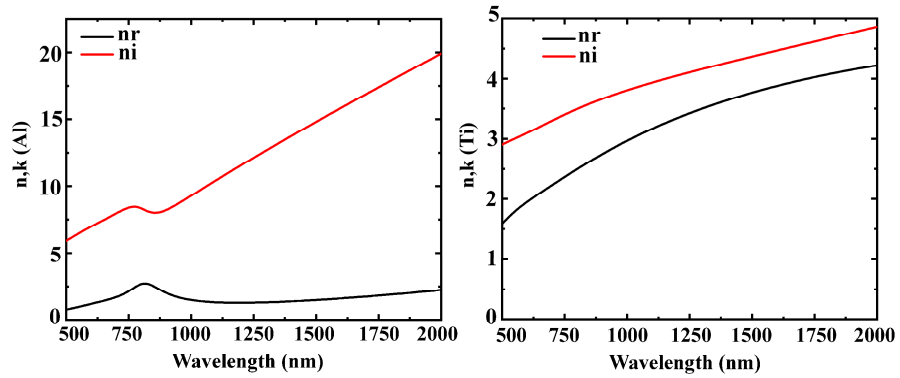


Figure S1 The refractive index (n, k) curves of metals Al and Ti calculated using the Drude-Lorentz model within the wavelength range of 500-2000 nm