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Fig. S1. The real part $\varepsilon_1(\omega)$ and the imaginary part $\varepsilon_2(\omega)$ of the dielectric constants for MoS₂, GaTe, and GaTe/MoS₂ vdWH, respectively. In the visible light region, the imaginary part of the dielectric constant of MoS₂ is larger than that of the GaTe. Also, the value of $\varepsilon_1(\omega)$ in the GaTe/MoS₂ vdWH is the largest one in these three cases. The analysis of $\varepsilon_2(\omega)$ is similar to that of $\varepsilon_1(\omega)$.



Fig. S2. Band structures of the GaTe/MoS₂ vdWH under compressive biaxial strains (a) -1%, (b) -3%, (c) -5%, (d) -7%, (e) -9% and tensile biaxial strains (f) 1%, (g) 3%, (h) 5%, (i) 7%, (j) 9%.