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Surface plasmon polaritons in topological insulators JUNJIE QI, Institute of Physics, Chinese Academy of Sciences, Beijing 100190, China, HAIWEN LIU, X.C. XIE, International Center for Quantum Materials, School of Physics, Peking University, Beijing 100871, China — We study surface plasmon polaritons on a topological insulator-vacuum interface. When the time-reversal symmetry is broken due to ferromagnetic coupling, the surface states exhibit a magneto-optical Kerr effect. This effect gives rise to a novel transverse-type surface plasmon polariton, in addition to the longitudinal type. In specific, these two types contain three different channels, corresponding to the pole of the determinant of the Fresnel reflection matrix. All three channels of the surface plasmon polaritons display tight confinement and a long lifetime and show strong light-matter coupling with a dipole emitter.

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