

Rashba states with unconventional spin texture in Ag-Bi self-assembled network

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The electronic structure of ultrathin Ag(111) films covered with an ordered Ag₂Bi arrangement was investigated by means of spin- and angle-resolved photoemission spectroscopy. Surface-state bands, spin split by the Rashba interaction, selectively couple to the quantum-well state bands, originally spin degenerate, in the metal film. Our results demonstrate that in a nonmagnetic metal film the spin degeneracy of the valence levels can be lifted by hybridization with Rashba-type surface-state bands. Moreover, when the said system is grown on ferromagnetic Fe(110) layer, the joint effect of exchange and Rashba spin-orbit interactions is observed and the system displays a particular combination of time-reversal and translational symmetry breaking that strongly influences its electronic structure. We also observe asymmetric band-gap openings, due to spin-selective hybridization between Rashba-split surface states and exchange-split quantum well states. If time permits I will also discuss our recent results of an ordered array of Bi monomer and dimer chains on the Ag(110) surface.