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Surface band topology of Ge on Ag(111)[1] ATHANASIOS DIMOULAS, EVANGELOS GOLIAS, EVANGELIA XENOGIANNOPOULOU, DIMITRA TSOUTSOU, POLIXRONIS TSIPAS, SIGIAVA GIAMINI, NCSR DEMOKRITOS, Athens, Greece — While compelling evidence for silicene on Ag (111) has been recently published [1], the existence of germanene remains elusive. We have performed MBE growth of (sub) monolayer Ge on single crystal Ag (111) substrates, supported by DFT calculations, with the aim to obtain germanene. RHEED data indicate a $\left(\sqrt{3} \times \sqrt{3}\right) R30^0$ superstructure, while *in-situ* ARPES reveals a rich surface band structure consisting of linearly, highly dispersive cone-like features with hexagonal and snow-flake warping clearly imaged in the constant energy contour plots k_x-k_y. Unlike the case of graphene-like 2D crystals where Dirac cones are expected at the K-points, here the cone-like features appear at the center (Γ points) of the surface Brillouin zone similar to what is observed in topological insulators. This suggests the possibility to witness a non-trivial surface band topology triggered by intrinsic spin-orbit coupling as predicted [2] for 2D honeycomb Ge lattices or by strong Ge and Ag p orbital hybridization in an ordered surface alloy Ag_2Ge.

[1] P. Vogt et al., PRL 108, 155501 (2012);
[2] C.C-Liu et al., PRL 107, 076802 (2011)

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