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**Flat band of midgap rotating surface states in 3D Dirac and Weyl semimetals under circularly polarized radiation** JOSE GONZALEZ, RAFAEL A. MOLINA, Instituto de Estructura de la Materia (CSIC), Madrid, Spain — We report the investigation of novel surface states which develop when 3D Dirac or Weyl semimetals are placed under circularly polarized electromagnetic radiation. We find that a gap opens up from the hybridization between Floquet side bands, which leads to the appearance of midgap surface states in the form of evanescent waves decaying from the surface exposed to the radiation. We observe a phenomenon reminiscent of Landau quantization by which the midgap surface states get a large degeneracy proportional to the radiation flux traversing the surface of the semimetal. We show that all these surface states carry angular current, leading to a modulation of their charge that rotates with the same frequency of the radiation, which should manifest in the observation of a macroscopic chiral current in the irradiated surface.

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