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Dynamical polarizability of the 2D pseudospin-1 dice lattice JOHN MALCOLM, ELISABETH NICOL, Guelph-Waterloo Physics Institute, University of Guelph — The two-dimensional dice lattice is composed of three triangular sublattices whose low-energy excitation spectrum consists of Dirac-Weyl fermions with pseudospin-1. The energy dispersion has two Dirac cones, like the pseudospin-1/2 two-triangular-sublattice graphene, with an additional third band exactly at zero energy. We present theoretical results for the electronic dynamical polarization function in the material. This is a fundamental entity in many-body physics, renormalizing the Coulomb interaction through the dielectric function. From the polarization function we also obtain the Lindhard function, the plasmon branch, and can discuss other screening effects. These are constrasted with those of graphene.

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