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Magneto-optics of general pseudospin-s two-dimensional Dirac-Weyl fermions JOHN MALCOLM, ELISABETH NICOL, University of Guelph — The popularity of graphene–a pseudospin-$\frac{1}{2}$ two-dimensional Dirac-Weyl material–has prompted the search for related materials and the characterization of their properties. The magneto-optical conductivity is calculated for systems that obey the general pseudospin-s two-dimensional Dirac-Weyl Hamiltonian, with particular focus on $s = \left\{\frac{1}{2}, 1, \frac{3}{2}, 2\right\}$. This follows previous work on the optical response of these systems in zero field [1]. In the presence of a magnetic field, Landau levels condense out of the $2s + 1$ energy bands [2]. As the chemical potential in a system is shifted, patterns arise in the appearance and disappearance of certain peaks within the optical spectra. These patterns are markedly different for each case considered, creating unique signatures for potential experimental observations. The general structure of each spectrum and how they compare is discussed.

[1] B. Dóra, J. Kailasvuori, and R. Moessner, Phys. Rev. B **84**, 195422 (2011).
[2] X. Lan, N. Goldman, A. Bermudez, W. Lu, and P. Öhberg, Phys. Rev. B **84**, 165115 (2011).

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