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Cascade of charge density waves in type-II Weyl materials and magnetotransport MAXIMILIAN TRESCHER, Freie Universität Berlin, Germany, EMIL J. BERGHOLTZ, Stockholm University, Sweden, MASAFUMI UDAGAWA, Gakushuin University, Tokyo, Japan, JOHANNES KNOLLE, Cavendish Laboratory, Cambridge, U.K. — Following the recent theoretical prediction of type-II Weyl semimetals, they have been experimentally observed in a number of different materials. The same materials are also known to possess intriguing magnetotransport properties, but whether or not these are related to the type-II Weyl properties remains unclear and no satisfactory explanation exists. Here, we investigate the effect of interactions in a simple model of a type-II Weyl semimetal in a strong magnetic field. We identify a novel charge density wave (CDW) instability even for weak interactions stemming from the emergent nesting properties of the type-II Weyl Landau Level dispersion. We map out the dependence of this CDW on magnetic field strength, tilt angle and chemical potential. Surprisingly, as a function of decreasing temperature a cascade of CDW transitions emerges. It is tempting to speculate about a connection with the unsaturated magnetoresistance as recently observed in WTe_2 .

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