Unified Theory of Magic Angles and Interference Commensurate Oscillations. SI WU[1], ANDREI LEBED[2], Dept. of Physics, University of Arizona, HEON-ICK HA, Dept. of Physics, Harvard University, MICHAEL NAUGHTON, Dept. of Physics, Boston College — We suggest the unification theory of angular magnetoresistance oscillations in low-dimensional metals with open sheets of Fermi surfaces. It is based on an idea that effective space dimensionality of electron spectrum and electron wave functions is changed at some special directions of a magnetic field. These 1D -> 2D dimensional crossovers are shown to be due to interference effects, which occur when electrons move in the extended Brillouin zone in a magnetic field. Our quantum mechanical approach allows to derive an equation which describes analytically both Magic Angles and Interference Commensurate oscillations in resistivity component, perpendicular to conducting layers, and reveals their common physical origin. We compare our results with experimental data obtained on $(TMTSF)_2ClO_4$ and $(TMTSF)_2PF_6$.

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