Effect of Magnetic Field on Electronic Nematic Order in a Bilayer System: Application to Sr$_3$Ru$_2$O$_7$

CHRISTOPH PUETTER, HYEON-JIN DOH, HAE-YOUNG KEE, Department of Physics, University of Toronto, Toronto, Ontario, Canada M5S 1A7 — Recent experiments on the bilayer compound Sr$_3$Ru$_2$O$_7$ suggest the existence of an electronic liquid-crystal phase. A possible explanation for the unusual behavior observed in this material is provided by an electronic nematic theory. Within this framework, a bilayer system undergoes multiple phase transitions and exhibits strong transport anisotropy. The model also incorporates an external in-plane magnetic field to study the effect on metamagnetic transitions and anisotropic transport. Details of our numerical calculations will be presented.