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Anisotropic transport in disordered double Weyl semimetal BAO-LONG XU, Peking University, China, SHANG LIU, Harvard University, USA, TOMI OHTSUKI, Sophia University, Japan, RYUICHI SHINDOU, Peking University, China — The stability of double Weyl semimetal in the presence of on-site disorder potential is examined thoroughly by numerical calculation of localization length, conductance and density of states. We use a tight binding model for a layered Chern insulator. An out-of-layer transport calculation and density of state calculation shows that the double Weyl semimetal is unstable and enters into diffusive metal even in the presence of weak disorder. Our in-layer transport calculation results found an unexpected oscillation behavior in localization length and conductance as a function of disorder strength. The oscillation behavior can be understood as the motion of doubly Weyl nodes with very long lifetime.

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