Transport in multi-Weyl semi metal junctions

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In this talk, we are going to focus on trapsort across junctions of multi-weyl semimetals characterized by non-linear dispersion in the transverse (x,y) direction: $ E(k_z=0, k_x, k_y) \sim |k_{\perp}|^{\alpha}$, where $\alpha=2,3$ and $k_{\perp}=\sqrt{k_x^2+k_y^2}$. We show that for these junctions between two disparate multi-Weyl semimetals with different α (where the topological charge changes across the junction), the tunneing conductance become independent of the junction barrier strength in the thin barrier limit. We demonstrate this property for both nornal-barrier-normal (NBN) and normal-barrier-superconducting (NBS) junctions of these materials, explain the reason behind this phenomenon, and discuss experiments which may test our theory.