Contribution ID : **162** Type : **not specified**

# Holographic Modeling and Realization of Topological Semimetal Coexistence States

*Tuesday, 3 December 2024 15:20 (30)*

We present holographic models exhibiting the coexistence state of topological semimetals, thereby providing us with a valuable tool to investigate the system's behaviour in the strongly coupled regime. A number of distinct bulk solutions, each exhibiting a different infrared (IR) behaviour, have been identified, and these correspond to different types of boundary state. These states encompass distinct topological phases, critical phases and topological trivial phases. Phase diagrams are plotted that exhibit qualitative similarity to the one obtained in the weak coupling limit. The anomalous Hall conductivity, which serves as an order parameter, and the free energy are calculated. The latter demonstrates the continuity of the topological phase transitions within the system. This work elucidates the similarities and differences between a topological system in the weak and strong coupling regimes, thereby paving the way for further experimental observations.

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**Session Classification :** Day 4: Parallel session II