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## $^8\text{Li}$ $\beta$ NMR studies of Epitaxial Thin Films of the 3D topological Dirac semimetal $\text{Sr}_3\text{SnO}$

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The inverse perovskite  $\text{Sr}_3\text{SnO}$  is a 3D cubic Dirac semimetal with a very small energy gap, a so-called topological crystalline insulator<sup>1</sup>. The unusual electronic structure confers a variety of novel properties, such as chiral topological surface states, and very strong itinerant electron orbital magnetism. Remarkably, when doped it also becomes superconducting<sup>2</sup>. In the most insulating samples, the Fermi level lies close to the Dirac points, and orbital magnetism is maximal. We report the results of ion-implanted  $^8\text{Li}^+$   $\beta$ NMR in Au capped epitaxial thin films of  $\text{Sr}_3\text{SnO}$  as a function of carrier content which can be finely tuned by the growth conditions. In addition, we stop the  $^8\text{Li}$  in the Au overlayer to seek proximal evidence of the chiral surface state.

In high magnetic field (6.55 T), we find remarkably little contrast in spin-lattice relaxation between low carrier density  $\text{Sr}_3\text{SnO}$  and the Au overlayer. In the insulator,  $1/T_1 \sim 0.14 \text{ s}^{-1}$  is slightly faster than Au at 300 K, while, in the overlayer, there is a small but systematic enhancement in  $1/T_1$ . The resonance in the insulator is broad with a long tail towards negative shift without resolved quadrupolar splitting.

<sup>1</sup>A.W. Rost et al., APL Materials 7, 121114 (2019).

<sup>2</sup>M. Oudah et al., Nat. Comm. 7 (2016) 10.1038/ncomms13617.

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