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Yu-Shiba-Rusinov states and topological superconductivity in Ising paired superconductors GIRISH SHARMA, Virginia Tech , SUMANTA TEWARI, Clemson University — An unusual form of superconductivity, called Ising superconductivity, has recently been uncovered in mono- and few-layered transition metal dichalcogenides. This 2D superconducting state is characterized by the so-called Ising spin-orbit coupling (SOC), which produces strong oppositely oriented effective Zeeman fields perpendicular to the 2D layer in opposite momentum space valleys. We examine the Yu-Shiba-Rusinov (YSR) bound states localized at magnetic impurities in Ising superconductors and show that the unusual SOC manifests itself in unusually strong anisotropy in magnetic field response observable in STM experiments. For a chain of magnetic impurities with moments parallel to the plane of Ising superconductors we show that the low energy YSR band hosts topological superconductivity and Majorana excitations as a direct manifestation of topological effects induced by Ising spin-orbit coupling.

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