

4CF14-2014-000172

Abstract for an Invited Paper
for the 4CF14 Meeting of
the American Physical Society

High pressure superconducting phase diagram of ${}^6\text{Li}$: anomalous isotope effects in dense lithium¹

SHANTI DEEMYAD, University of Utah

The emergence of exotic quantum states, such as fluid ground state and two component superconductivity and superfluidity, in a compressed light metallic system has been entertained theoretically for metallic phases of hydrogen. The difficulty of compressing hydrogen to metallization densities, has prevented experimental proof of these effects. Studying lithium, which is isovalent to hydrogen and the lightest metal, is considered as a route to studying the lattice quantum effects in a dense light metallic system. In this talk by comparing the superconductivity of lithium isotopes under pressure, I present evidence that properties of lithium at low temperature are significantly dominated by its lattice quantum dynamics. I will also present the superconducting phase diagram of ${}^6\text{Li}$ in a broad range of pressures up to 60GPa. This study is the first experimental report on superconducting properties of ${}^6\text{Li}$; the lightest superconducting material.

¹This work is supported by NSF-DMR grant # 1351986.