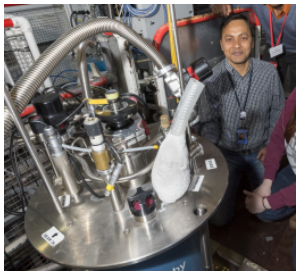

Contribution ID: **7** Type: **not specified**

Probing the Superconducting Gap Structure in the Noncentro symmetric Topological Superconductor ZrRuAs and HfRuP

Tuesday, 12 September 2023 14:20 (20 minutes)

The superconducting gap structure of the topological superconductor candidates ZrRuAs and HfRuP with a noncentrosymmetric crystal structure has been investigated using muon-spin rotation/relaxation (μSR) measurements in transverse-field (TF) and zero field (ZF) geometries [1, 2]. Magnetization and electrical resistivity measurements reveal bulk superconductivity below a superconducting transition temperature Tc = 7.9(1) K in ZrRuAs and below 9.0(1) K in HfRuP. The temperature dependence of the effective penetration depth obtained from the TF-μSR spectra, and the electronic heat capacity in the superconducting state of ZrRuAs, are well described by an isotropic s-wave gap model. Our TF-μSR study of HfRuP also confirms the s-wave gap symmetry in HfRuP. Comparison of the electronic mean free path with the superconducting coherence length suggests superconductivity in the dirty limit in ZrRuAs. Our ZF μSR data of both the compounds show that there is no significant change in the muon-spin relaxation rate above and below Tc, indicating that time-reversal symmetry is preserved in the superconducting state. The results of the present study will be important to understand the superconductivity in other topological superconductors.

References

[1] D. Das et al, Phys. Rev. B 103, 144516 (2021).
[2] D. Das et al, Magnetochemistry, 8, 135, (2023);
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