Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **483** Type: **Poster Competition (Graduate Student) / Compétition affiches (Étudiant(e) 2e ou 3e cycle)**

(G*) POS-G61 – μSR study of superconducting Re-B compounds

Wednesday 9 June 2021 13:53 (2 minutes)

The discovery of time-reversal symmetry(TRS) breaking in elemental Re has ignited fresh interest in the Re based superconductors. The recent studies show that role of Re concentration and crystal symmetry is crucial in understanding the unconventional superconductivity of these compounds. Therefore, we studied two Re-based superconductors Re_3B (<var>T_C</var> = 5.19 K) and Re_7B_3 (<var>T_C</var> = 3.2 K) having a centrosymmetric and non-centrosymmetric crystal structure, respectively. In this talk, we will present a comprehensive study on superconducting properties of Re_7B_3 and Re_3B through specific heat, magnetic susceptibility, resistivity, and transverse and zero-field muon rotation/relaxation (μSR) experiments. This will include the temperature dependence of penetration depth using transverse-field μSR measurements, which will be used to determine the symmetry of the superconducting gap. To further explore these materials, we performed the zero-field μSR measurements, which show the evidence for TRS preserving superconducting state for both materials in the limits of our measurements.

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Session Classification: W-POS-G #57-74 Poster session (Mag.North) / Session d'affiches (Nord mag.)

Track Classification: Magnetic North/Magnétisme Nord