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Magnetism in Bulk Vanadium Dioxide Compounds P. W. MENGYAN, R. L. LICHTI, B. B. BAKER, G. JAYARATHNA, Texas Tech University — Vanadium dioxide (VO_2) compounds show a metal-semiconductor transition (MST) near room temperature (stoichiometric VO_2 is metallic $T > T_{MST} \approx 340$ K and semiconducting $T < T_{MST}$) that is accompanied by a structural transition; both can be triggered by thermal, optical, electrical or barometric means. This ultrafast (sub ms) transition has been studied extensively and there is still considerable disagreement regarding the mechanism responsible for these transitions. Incorporation of a few atomic percent of H in VO_2 stabilizes the metallic phase down to 200 K. Impurities such as W, Ti, Au, Cr or F lower or raise T_{MST} without significantly modifying other properties. Some effects that dopants have on the material are well known, however, the role dopants play in modifying them is far from understood. This contribution presents results of the first muon spin rotation and relaxation (MuSR) measurements on bulk VO_2 compounds where we find and characterize a low temperature magnetic phase that has not yet been reported. The introduction of 2.4 at% of W or 5 at% of Ti raise the onset of the magnetic phase from 35 K to nearly 170 K. MuSR probes the local magnetic environment and hence provides a direct measure of the local field properties.

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