

Abstract Submitted  
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**Probing Local features in Dilute Magnetic Semiconducting ZnGeP<sub>2</sub>:Mn via MuSR**<sup>1</sup> P.W. MENGYAN, R.L. LICHTI, B.B. BAKER, Texas Tech University, Physics, Y.G. CELEBI, E. CATEK, Istanbul University, Beyazit 3449 Istanbul, Turkey, K.T. ZAWILSKI, P.G. SCHUNEMANN, BAE Systems, Advanced Systems and Technology, Nashua, NH — The conventional semiconducting properties and the discovery of room temperature ferromagnetism in weakly Mn doped II-IV-V<sub>2</sub> chalcopyrite semiconductors make these materials prime candidates for prospective use in the field of spin-electronics. The mechanism responsible for connecting the local magnetic features to the bulk magnetic properties is not yet understood in these materials. Muon Spin Research (MuSR) utilizes the unique sensitivity of 100% spin polarized and positively charged muons to probe local magnetic and electronic environment. We have initiated a MuSR investigation on dilute magnetic semiconducting II-IV-V<sub>2</sub> specifically focused on the, yet to be understood, magnetic features. This contribution presents results of our first set of MuSR measurements on four different ZnGeP<sub>2</sub>:Mn; each with a different Mn content. We have detected at least three distinct spin fluctuation regimes; antiferromagnetic, ferromagnetic and one that is possibly related to spin polaron formation. Considerable amounts of modeling and measurements are required in order to develop a more complete characterization and assignment for each of these features. These are promising first steps in the larger-scale project of developing a more complete understanding of the magnetic features in DMS systems.

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P.W. Mengyan  
Texas Tech University

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