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Hyperfine Spectroscopy and Characterization of Muonium Centers in $ZnGeP_2$ PATRICK MENGYAN, B.B. BAKER, R.L. LICHTI, Texas Tech University, K.H. CHOW, University of Alberta, Edmonton, Y.G. CELEBI, Istanbul University, Beyazit, K.T. ZAWILSKI, P.G. SCHUNEMANN, BAE Systems — We have recently initiated a study of the defect states formed when positive muons are implanted into chalcopyrite structured II-IV-V_2 compounds to extend our investigation of the muonium defect centers as an experimentally accessible analog of isolated hydrogen defect states in semiconductors. In this presentation, I will discuss one of the initial observations of neutral muonium defect centers in $ZnGeP_2$; specifically, the hyperfine characterization of the neutral muonium centers observed in $ZnGeP_2$ using the Muon Spin Relaxation technique (MuSR). The spin precession frequencies in a field of 4.0 Tesla yield a zero-temperature hyperfine constant of $\sim$1962 MHz for the promptly formed Mu^0 state. Subsequently, we performed T_1^{-1} longitudinal depolarization measurements in low magnetic fields. Decoupling curves show a different anisotropic Mu^0 with A_2=3185 MHz and D=374 MHz, where the D is the dipolar contribution. I will report on the spectroscopic hyperfine characterization of the neutral muonium centers observed in $ZnGeP_2$.

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