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MEμSR study of MgO: Search for O^{-1} Earthquake-like Precursors G. WELCH, San Jose State University, S.B. LEE, University of CA Riverside, C.E. JOHNSON, A. LOVE, C. BOEKEMA, San Jose State University, F.T. FREUND, NASA Ames Mountain View CA — While many precursory signals of earthquakes are known to exist, interpretation of these signals is inadequately understood [1-3]. Earthquake-like precursor effects are detected by studying the signals generated by positive holes in MgO using Muon-Spin Resonance (μSR) and Maximum Entropy (ME). As an abundant earth-crust compound, MgO is an ideal model for studying eartquake-like signals [3]. Positive hole formation results from a break in an oxygen anion pair under elevated temperature, or high stress conditions [2]. For a 3N-MgO single crystal at elevated temperatures, a small percentage of oxygen is predicted to be in an O^{-1} state instead of normal O^{-2} ions. Preliminary ME analysis of transverse field (100 Oe) μSR MgO data show asymmetrical ME peaks at $\sim$ 1.4 MHz. Small T-dependent deviations from a Lorentzian (Lor) signal seem to be effects of O^{-1} states in MgO. Tentatively, we have fitted ME transforms with three Lor's to obtain a reasonable description of the 1.4-MHz peak. The T dependences of this 3-Lor set are reported and discussed. Research is supported by RSCA-SJSU, SETI, WiSE@SJSU and AFC San Jose.

[1] FT Freund, Nat Hazards Earth Sys Sci **7** (2007) 1-7.
[2] FT Freund *et al,* Phys Chem Earth **31** (2006) 389.
[3] K Tyson et al, SJSU internal Report (2011); S Lee *et al,* abstract HUIC Educ, Math & Eng Tech Conf (2013).

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