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Muon-bonding site search in MgO: possible implications for earthquake-precursor detection[1] I LIN, M DAM, S WELCH, CAROLUS BOEKEMA, San Jose State University — A computational model is used to study and locate the muon-bonding sites in MgO. Likely, the positive muon localizes in a vacant oxygen tetrahedron. This is similar to what has been observed in other well-known oxides like Fe_2O_3. Potentials are given by a Morse function (describing the muon-oxygen bonding) and Coulombic interactions between the muon and the four O[-2] ions. We plan to extend our work to a larger cluster, extending over a couple of lattice cells (and later over the whole lattice). These investigations are performed in support of Muon-Spin-Resonance (μSR) MgO & MnO studies, [1] for which μSR signals have been observed. For MnO, only one signal has been observed, as expected. In MgO, an additional sharp signal has been seen, suggesting the existence of extended O[-1] states.[1] The latter can be seen as O[-1] earthquake-like precursor effects. [2] 1] C Boekema *et al,* APS March meeting (2016). 2] FT Freund, Nat Hazards Earth Sys Sci **7** (2007) 1; FT Freund *et al,* Phys Chem Earth **31** (2006) 389.

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