Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Structural Phase Transition in Zircon and Hafnon studied by Perturbed Angular Correlation Spectroscopy HERBERT JAEGER, Miami University, SEAN MCBRIDE, Miami University — We have used perturbed angular correlation spectroscopy (PAC) to determine the electric field gradient (EFG) at the Zr-site in zircon ($ZrSiO_4$) between room temperature and 1400 K. The EFG is axially symmetric and the quadrupole interaction frequency v_Q decreases linearly with increasing temperature. For very pure zircon samples the slope of the v_Q *vs.* T increases above $1000K$; this is consistent with a displacive structural transition reported in the literature.[1] However, zircon samples with a moderate impurity concentration do not show this behavior. In order to learn more about this structure we have begun performing PAC experiments on isostructural hafnon ($HfSiO_4$), which was synthesized in our laboratory. PAC spectra of hafnon are very similar to those of zircon but show a small second-site interaction, which we believe to be due to residual HfO_2 from the sample preparation. The temperature dependence of the quadrupole interaction frequency will be discussed in context of a displaceive phase transition in these materials. [1]Z. Mursic, T. Vogt, and F. Frey, Acta Cryst. **B48** (1992) 584.

Herbert Jaeger
Miami University

Date submitted: 01 Dec 2004 Electronic form version 1.4