Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

High-Resolution Thermal Expansion Measurements of Single-Crystal Sapphire for Application as X-Ray Backscattering Monochromator[1] JOHN J. NEUMEIER, Montana State University, I. SERGEEV, European Synchrotron Radiation Facility, D. BESSAS, R.P. HERMANN, Forschungszentrum Juelich — We report measurements of the thermal expansion of high-purity single crystal sapphire along the a and c directions. The data were acquired using a thermal expansion cell that is constructed of fused silica with a relative resolution of approximately $3x10^{-9}$. Comparison will be made to existing literature values determined from dilatometry and high-resolution x-ray diffraction. This project's main goal is the use of sapphire as x-ray backscattering monochromator for phonon spectroscopy using nuclear inelastic scattering. Tuning of the monochromator is done by varying the sapphire temperature, and the new thermal expansion values will improve the energy calibration.

[1]This material is based upon work supported by the National Science Foundation (Grant DMR-0907036).

John J. Neumeier
Montana State University

Date submitted: 30 Nov 2010 Electronic form version 1.4