

## **CHESSE Proposal for Spring 2011 run**

### 1. (Title)

Evaluation of Diamond Thinning Techniques Through Rocking Curve Measurements

### 7. (Abstract)

The GlueX experiment under construction in Jefferson Lab aims to explore the spectrum of hadrons with excited gluonic degrees of freedom via diffractive production using a high energy, linearly polarized photon beam. A high luminosity photon beam with linear polarization is achieved through Coherent Bremsstrahlung of high-energy electrons on a single-crystal diamond wafer (radiator). The degree of linear polarization within the coherent bremsstrahlung peak is sensitive to the mosaic spread of the radiator crystal, requiring rocking curve measurements of candidate radiators. Efficacy of such measurements has been demonstrated in prior feasibility studies at CHESSE station C1. Currently, several diamond different thinning processes are being explored, requiring quality assessments to be performed at various stages along the production pipeline. The proposed test aims to characterize samples of untouched 300 micron diamond wafers, and two samples already thinned by two competing techniques, to determine their effectiveness.

### 8. (Prior publications)

G. Yang, R. Jones, F. Klein, K. Finkelstein, K. Livingston. "Rocking curve imaging for diamond radiator crystal selection", *Diamond & Related Materials* 19 (2010)