Abstract Submitted
for the HAW09 Meeting of
The American Physical Society

PIXE Analysis of Ceramic Artifacts ELIZABETH HIGH, LARRY LAMM, MARK SCHURR, EDWARD STECH, MICHAEL WIESCHER, University of Notre Dame — Particle Induced X-ray Emissions, or PIXE, is a nuclear physics technique used as a non-destructive material analysis method which gives a detailed and comprehensive profile of the elemental composition of a target. Using the University of Notre Dame KN and FN accelerators in the ISNAP laboratory a beam of particles, here protons, is accelerated and used to knock out electrons from lower orbitals within the target resulting in characteristic X-rays. Under optimum operating conditions data from PIXE can not only give information about which elements are present in a sample but also their relative abundances in parts per million. In a previous run done in collaboration with the Anthropology Department at the University of Notre Dame pottery shards from the Collier Lodge, located in northwest Indiana, were analyzed and only relative abundances were able to be compared between samples. We are now implementing a new setup into the beamline which will incorporate the ability to take Rutherford Back Scattering, or RBS, measurements of the beam during the PIXE runs, which will allow for a standard normalization for the runs and give the facility the ability to acquire a more absolute and quantitative analysis of the data. Initial results using the same pottery shards as a comparative data set will be presented.

Elizabeth High
Department of Physics, University of Notre Dame

Date submitted: 03 Aug 2009 Electronic form version 1.4