

Abstract Submitted
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Development and Commissioning of an External Beam Facility in the Union College Ion Beam Analysis Laboratory JOSHUA YOSKOWITZ, MORGAN CLARK, SCOTT LABRAKE, MICHAEL VINEYARD, Union College — We have developed an external beam facility for the 1.1-MV tandem Pelletron accelerator in the Union College Ion Beam Analysis Laboratory. The beam is extracted from an aluminum pipe through a 1/4" diameter window with a 7.5- μm thick Kapton foil. This external beam facility allows us to perform ion beam analysis on samples that cannot be put under vacuum, including wet samples and samples too large to fit into the scattering chamber. We have commissioned the new facility by performing proton induced X-ray emission (PIXE) analysis of several samples of environmental interest. These include samples of artificial turf, running tracks, and a human tooth with an amalgam filling. A 1.7-MeV external proton beam was incident on the samples positioned 2 cm from the window. The resulting X-rays were measured using a silicon drift detector and were analyzed using GUPIX software to determine the concentrations of elements in the samples. The results on the human tooth indicate that while significant concentrations of Hg, Ag, and Sn are present in the amalgam filling, only trace amounts of Hg appear to have leached into the tooth. The artificial turf and running tracks show rather large concentrations of a broad range of elements and trace amounts of Pb in the turf infill.

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