

Abstract Submitted
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PIXE Analysis of Atmospheric Aerosol Samples in an Urban Area in Upstate NY¹ BENJAMIN NADARESKI, SALINA ALI, JOSH YOSKOWITZ, MICHAEL VINEYARD, SCOTT LABRAKE, Union College Department of Physics and Astronomy — Extremely fine particles (PM_{2.5}) are found to penetrate deep into the lungs and hence, are found to have harmful health effects on humans. Atmospheric aerosol samples collected in Schenectady, NY were analyzed for evidence for air pollution; specifically lead pollution over the past 12 months. Air samples were collected on 7 μ m Kapton foils using a nine-stage cascade impactor that separates the particulate matter by aerodynamic size. A 2.2MeV proton beam impacts the target samples. X-ray intensity versus energy spectra was produced using an Amptek silicon drift detector. Proton-induced x-ray emission (PIXE) techniques were used to analyze the energy spectra and we determined a range of 16 elements present in the aerosol samples including, Al, Si, P, S, Cl, K, Ca, Ti, Cr, Mn, Fe, Ni, Cu, Zn, Br, and Pb. The elemental composition and concentrations of these elements were determined using GUPIX. Many of the elements suggest airborne soils, however we see trace amounts of lead concentrations only at the minimal level of detection around 1 ng/m³. Preliminary results suggest that lead pollution is not significant however; we believe that the trace amounts of lead detected are due to fuel emissions from small aircraft due to the sampling site near an airport.

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