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Exploring Atmospheric Aerosols as A Possible Explanation for DAMA/LIBRA Signal CHRISTIAN MONTERO, JAMES D'ANNIBALE, MATHEW BELLIS, Siena Coll — DAMA/LIBRA is an ongoing dark matter detection experiment conducted in Gran Sasso, Italy. Over 20 years, scientists have collected data that corresponds with an annual modulation one would expect from the motion of the Earth and the Sun through a galactic halo of dark matter. Because there has not been confirmation from similar experiments, the broader community has suggested that there is an alternative, non-dark matter explanation for the DAMA modulation. Our hypothesis is that seasonal fluctuations in the amount of potassium-40, a naturally occurring radioactive isotope, in aerosols which then finds its way into the experiment, is the cause of the DAMA signal. To collect the aerosols, we used a cascade impactor, a standard tool in the atmospheric aerosol community, and we also built an aerosol collector out of PVC pipe and 3D printed parts for comparison. To analyze the elemental composition of our samples we have explored the use of an X-Ray Fluorescence machine, and we utilized the PIXE accelerator at Union College. The current status of this work will be presented.

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