

Developing a search for annual modulation of various elements in atmospheric aerosols

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If dark matter interacts weakly then one possible experimental signal would be an annual modulation in the interaction rate caused by the combined motion of the sun and earth moving through the dark matter halo. The DAMA-LIBRA experiment has observed such a modulation in their detector in a way not described by known modulating backgrounds such as atmospheric muon rate (thickness/density of atmosphere), radon gas, or solar neutrino interactions (apogee/perigee effect). In this talk, we describe the prototype development of a device to collect aerosols on a daily basis to search for modulations of atmospheric concentrations of elements which have naturally occurring radioactive isotopes like potassium. Depending on the size of the effect, this background process could theoretically be misinterpreted as a dark matter signal.

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