Argon Depletion for a Large Scale Dark Matter Detector[1] DANA
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KELLER, University of South Dakota — Argon depleted of ^{39}Ar utilizing thermal
diffusion methods is being implemented in 20 columns at USD. Thermal diffusion is
a well-known technique in isotope separation. The columns are 3 meters long and 0.5
inch in diameter. This test system will allow us to deplete ^{39}Ar by a factor of 10 for 1
kg of natural argon over two months. This would lead to the full-scale production of
depleted argon by using more columns that are longer in length. This depleted argon
can then be used as a target material for next generation dark matter detectors.
Using an advanced automation system, we can run our test system continuously to
extract the enriched ^{39}Ar for eventual measuring at ANL. The interim results of the
test system will be reported utilizing the more abundant isotope ^{36}Ar. In addition,
the current effort for obtaining ^{39}Ar results will be presented.

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