

Underground Argon for Low Background Detectors

Ben Loer, Princeton University (bloer@princeton.edu)

The excellent scintillation characteristics of argon, including a high light yield and strong discrimination between minimum and highly ionizing particles, make it a valuable material for use in a variety of detectors, most notably detectors of WIMP-induced nuclear recoils. However, the presence of the cosmogenically induced radioactive isotope ^{39}Ar in atmospheric argon generates a background rate of ~ 1 Bq/kg atmospheric argon. We have recently identified sources of argon in underground reservoirs with ^{39}Ar content reduced by at least a factor of 20 (limit only) with respect to atmospheric argon. This brings multi-ton scale liquid argon detectors into the realm of possibility.