

Abstract Submitted
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Depleted Argon from Old-Water Underground at Wall, South Dakota¹ JASON SPAANS, DONGMING MEI, University of South Dakota, ANDREW HIME, Los Alamos National Laboratory, ZHONGBAO YIN, MILES KOP-PANG, YONGCHEN SUN, University of South Dakota, VICTOR GEHMAN, Los Alamos National Laboratory, DEAP/CLEAN COLLABORATION — The purpose of this project is to investigate the possibility of using underground water as a source for depleted argon which will be the target material for next generation dark matter detectors at deep underground laboratories and to design a machine that would extract argon from underground water. The only source of ^{39}Ar from old underground water is ^{39}Ar that is produced from (n,p) reactions with ^{39}K . An analysis of the soil was conducted to determine the ^{39}K content and the number of free neutrons due to (α ,n) reactions induced by ^{232}Th and ^{238}U decay. This was done with atomic absorption spectrometry and a low background counting facility, respectively. The results indicated that the soil contains approximately 2% ^{39}K and 2 neutrons/y/g/ppm. As a result, ^{39}Ar is predicted to be about a factor of 70 lower than atmospheric level. In addition, a machine was designed that would be capable of extracting argon from underground water.

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