

Abstract Submitted
for the APR08 Meeting of
The American Physical Society

Discovery of underground argon with low level of radioactive ^{39}Ar and possible applications to WIMP dark matter detectors. CRISTIANO GALBIATI, Princeton University — We report on the first measurement of ^{39}Ar in argon from underground natural gas reservoirs. The gas stored in the US National Helium Reserve was found to contain a low level of ^{39}Ar . The ratio of ^{39}Ar to stable argon was found to be $<4 \times 10^{-17}$ (84% C.L.), less than 5% the value in atmospheric argon ($^{39}\text{Ar}/\text{Ar}=8 \times 10^{-16}$). The total quantity of argon currently stored in the National Helium Reserve is estimated at 1000 tons. ^{39}Ar represents one of the most important backgrounds in argon detectors for WIMP dark matter searches. The findings reported demonstrate the possibility of constructing large multi-ton argon detectors with low radioactivity suitable for WIMP dark matter searches.

Cristiano Galbiati
Princeton University

Date submitted: 14 Jan 2008

Electronic form version 1.4