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Measurement of the Kr-85 Activity in the GERDA Liquid Argon

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The ^{85}Kr radioactive isotope is found in significant quantities in the atmosphere largely as a result of nuclear industry. Its β -decay with a half-life of 10.8 years and a Q-value of 687 keV is a dangerous background source for low-threshold noble liquid detectors, which distill their detector medium from air. The GERDA experiment was operating high-purity germanium detectors immersed in a clean liquid argon bath deep underground to search for neutrinoless double beta decay with unprecedented sensitivity. The ^{85}Kr activity in the liquid argon at cryostat filling time has been determined through an analysis of the full GERDA Phase II data set by exploiting the excellent γ -ray spectroscopic capabilities of the experiment.

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