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Measurement of the argon purity by ICPMS and results of the analysis of the argon used for the MicroBooNE and ArDM experiments

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Measuring the argon purity is critical for all Ar-based rare event research experiments. Mass spectrometry is typically used to measure U and Th contamination in samples of the materials used to build a low-background detector; however, this technique has the potential to provide other valuable information that is typically not exploited. At CIEMAT, we have shown that, by ICPMS, it is possible to identify and quantify contaminants in the argon. Preliminary tests were done with the gas extracted from the experiments MicroBooNE at FNAL and ArDM at LSC. In the former case, we identified some typical argon contaminants and compared the ICPMS results with those of commercially available argon gas. In ArDM, we identified and quantified the presence of mercury in the argon used in the experiment. This unexpected contamination had to be accounted for in the experiment's light propagation model.

This talk will present the idea behind this technique, the preliminary results, and some prospects for future experiments.

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