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(G*) The characterization of a spatially resolved multi-element laser ablation ion source

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We report on the development of a multi-element ion source for calibration of a multi-reflection time of flight mass spectrometer. A laser ablation ion source (LAS) has been developed that can deliver specific, diverse species of ions from multi-element targets. It has been demonstrated that different target materials may be selectively ablated with a spatial resolution lower than 100μm. Ion bunches produced by laser-ablation of the target surface will be used to characterize the ion extraction and identification capabilities of the Ba-tagging system. The latter is being developed as a future upgrade to the nEXO experiment, which is a proposed neutrinoless double beta decay experiment that will deploy 5-tonnes of liquid xenon enriched in the isotope Xe-136 in a time-projection chamber. The projected sensitivity of nEXO is 10^28 years. Ba-tagging may allow for the unambiguous identification of a candidate 0νββ event as a true ββ decay and increase the sensitivity of nEXO.

We will present the LAS as well as systematic studies on spatial resolution that have been performed.

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