

Proton capture on ^{91}Nb in ESR

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We intend to submit a proposal to measure the reaction $^{91}\text{Nb}(p,g)^{92}\text{Mo}$ in ESR as a continuation of the proton-capture campaign that has been very successful in the recent past. ^{91}Nb is a radionuclide, which in a first step has to be produced in FRS using a primary beam of ^{94}Mo or similar. Furthermore, accumulation, cooling and deceleration in the ESR down to energies of 5-10 MeV/u are needed, as it was already demonstrated for fragments of ^{118}Te in E127.

The solar amounts of $^{92,94}\text{Mo}$ and $^{96,98}\text{Ru}$ are not reproduced by current models of explosive nucleosynthesis, which prone to the large nuclear physics uncertainties connected to unstable nuclei. The reaction $^{91}\text{Nb}(p,g)$ is one of the key reactions of the nucleosynthesis around this long-standing Mo/Ru anomaly. It is the main source of uncertainty for the production of ^{92}Mo in the gamma process and also a central part of the $^{92}\text{Nb}/^{92}\text{Mo}$ chronometer. By direct measurement of the reaction cross-section, the tremendous uncertainties in the gamma process yields can be diminished and a reliable application of the chronometer feature is in reach. Both of these targeted results represent a major step towards clarifying the mysterious origin of ^{92}Mo and its nuclear neighborhood.

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