

NEW NEUTRON CAPTURE AND TRANSMISSION MEASUREMENTS FOR $^{134,136}\text{Ba}$ AT ORELA AND THEIR IMPACT ON s -PROCESS NUCLEOSYNTHESIS CALCULATIONS

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We have made high-resolution neutron capture and transmission measurements on isotopically enriched samples of ^{134}Ba and ^{136}Ba at the Oak Ridge Electron Linear Accelerator (ORELA) in the energy range from 20 eV to 500 keV. Previous measurements had a lower energy limit of 3 – 5 keV, which is too high to determine accurately the Maxwellian-averaged capture cross section at the low temperatures ($kT = 6 - 12$ keV) favored by the most recent stellar models of the s process. Our results for the astrophysical reaction rates are in good agreement with the most recent previous measurement at the classical s -process temperature, $kT = 30$ keV, but show significant differences at lower temperatures. We discuss the astrophysical implications of these differences.

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