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Neutron-capture elements in globular cluster M15

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We report on observations of six giants in the globular cluster M15 (NGC 7078). The Subaru/HDS was used to measure neutron-capture elemental abundances. Previous studies have reported a significant star-to-star variation in the neutron-capture elemental abundances of M15, and deduced that their origin was from the r-process. Our abundance analyses based on high-quality blue spectra confirm the scatter in the abundances of heavy neutron-capture elements (e.g., Eu). Observed [La/Eu] ratios indicate there are no significant s-process contributions. We have found, for the first time, that there are anti-correlations between the abundance ratios of light to heavy neutron-capture elements ([Y/Eu] and [Zr/Eu]) and heavy ones (e.g., Eu). This indicates that light neutron-capture elements in these stars cannot be explained by only a single r-process, but another process that has significantly contributed to the light neutron-capture elements is required to have occurred in M15. We will also discuss possible r-process enrichment model to explain our results.

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