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## The creation of the first r-process peak in neutron star mergers, impact of nuclear masses and beta decay rates.

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The observation of the electromagnetic counterpart of GW170817 gravitational wave hinted the production of r-process elements in the aftermath of neutron star mergers. The color of the electromagnetic counterpart suggests there are at least two different contributions of electron fraction ( $Y_e$ ) distributions, one moderately high, reproducing the light r-process elements, and one  $< 0.25$  reproducing heavier nuclei including the lanthanide elements. We present a study for the creation of the first r-process peak using astrophysical conditions matching the ones speculated for neutron star mergers. We identify the range of  $Y_e$  that can reproduce the first r-process peak and the effect of specific nuclear masses and beta decay rates on it.

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