# Mass measurements of neutron-rich gallium isotopes and the production of the first r-process abundance peak elements

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The r-process is responsible for the production of about half of the heavy elements observed in the solar abundances. The site of the r-process was unknown until recent observations. The gravitational wave event GW170817, which was identified as a binary Neutron Star Merger (NSM), was followed by the detection of fast fading optical counterpart that is consistent with predictions for a kilonova/macronova, associated with r-process nucleosynthesis [1,2]. In particular the observation of a bright, fast fading UV component, established the production of heavy element in the aftermath of the neutron star merger.

Since the complicated atomic structure of lanthanides implies high opacity ejecta which would shift the wavelength of the observed light to the red, the blue color of the ejecta indicates the presence of material with relatively high electron fractions and consequently low lanthanide production[3,4,5]. Recent mass measurements of neutron rich gallium masses affect the production of elements of the first r-process peak. We present a study of nucleosynthesis for conditions of high $Y_e$ outflows from NSMs and investigate the effect of the recently measured

Ga masses and the conditions under which this could be the site for the production of the elements of the r-process abundance pattern for A $< 100$.

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