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Stratification of the Crust of Magnetars and Nuclear Abundances

The r-process triggered by the decompression of ejected crustal materials from binary neutron star mergers has been recently confirmed by observations of the kilonova following the detection of gravitational waves from GW170817. Isolated neutron stars endowed with very high magnetic fields, so called magnetars, might be also at the origin of r-process nucleosynthesis since some material is ejected during giant flares. The final abundance distribution depends on the crustal composition. Making use of the latest experimental nuclear mass data supplemented with microscopic models, we show that the presence of a high magnetic field can have a significant influence on the stratification of neutron-star crusts and on the nuclear abundances of the different layers.

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