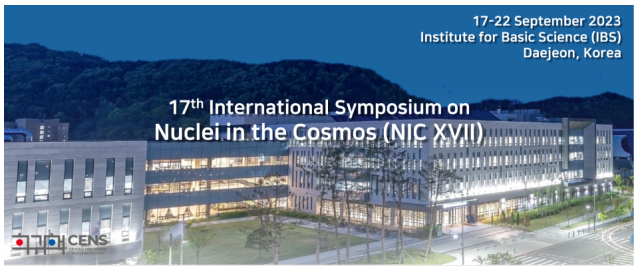

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Optical properties of magneto-rotaional jet-driven supernovae associated with r-process nucleosynthesis

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Magnetorotational-driven supernovae (MRNSe) are a peculiar type of core-collapse SNe. Their progenitors are fast-rotating massive stars with strong magnetic fields and they are candidates for the central engine of hypernovae and gamma-ray bursts. They are also expected to be astronomical sites for the r-process, as they have a different explosion mechanism from regular SNe. MRSNe may have very neutron-rich ejecta suitable for the r-process due to the strong effect of the jet-driven explosion. In studies of galactic chemical evolution, MRSNe are expected to be additional r-process sources because they have different frequencies and delay times from neutron-star mergers. Although some observations suggest jet-like SNe, the occurrence of r-process nucleosynthesis has never been directly confirmed. In this presentation, we focus on the effect of r-process nucleosynthesis in MRSNe on possible observational properties in SN light curves. The r-process occurring in the central region of the SN provide different opacity and heating sources compared to canonical core-collapse SNe. We quantitatively investigate the effects of r-process elements and ^{56}Ni abundances on the light curves based on a series of radiative hydrodynamics simulations. We confirm that the influence of the r-process is not significant for all models, which is consistent with the fact that we have not still identified r-process elements in SNe. However, there are some models where the existence of r-process elements can be observationally confirmed by current high presicition obervations (e.g., JWST) and future telescopes.

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