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Luminous, magnetar-powered supernovae

Friday, 12 July 2024 16:00 (15 minutes)

Superluminous supernovae are a class of exceedingly bright transients whose luminosity cannot be comfortably explained by the standard 56Ni-decay picture. The quest for an alternative scenario has pointed at the contribution of a nascent millisecond magnetar and/or at the interaction of the supernova ejecta with a circumstellar medium surrounding the progenitor star; however, some of the observed photometric and spectroscopic features of many superluminous supernovae are seemingly reminiscent of a 56Ni-decay contribution. I present the results of the spectrophotometric observational campaigns of a sample of hydrogen-poor superluminous supernovae collected with the ePESSTO+ and/or NUTS2 and/or ZTF collaborations, discuss the observational data in the framework of the magnetar and the circumstellar-interaction scenario and, in some cases, I suggest the possible contribution of 56Ni.

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