ASSEMBLING LIGHT CURVES OF ZTF SUPERLUMINOUS SUPERNOVAE

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A star that collapses under its own gravitational force, results in a core-collapse supernova (CC-SN). Superluminous supernovae (SLSNe) are CC SNe which can be about a 100 times more luminous than an average CC SN. The extra luminosity in Type-I SLSNe is generally explained by the formation of magnetar; supported by high rise time and hence high total energy; where the massive magnetic energy is transferred to surrounding supernova ejecta. Interestingly, the late time spectra of SLSNe-I closely resembles that of Type Ic CC SNe. The luminosity of Type Ic SNe can be explained by radioactive decay of nickel formed when the core of the progenitor star collapses. It is possible that both of these classes always have some level of magnetar power and radioactive power at the same time, but the relative strength of the two varies. To gain more insight into the powering mechanism and relation between these two types, high quality lightcurves needed for model fitting are produced by reprocessing ZTF pipeline data. This method performs forced point spread function (PSF) photometry. SN fluxes at quiescent phases are recomputed and errors rescaled to apply any existing offsets to the pipeline data. Non-detections over carefully selected multi-epoch are coadded using inverse flux model to achieve better depths. This coherent lightcurve database can be directly fed into modeling softwares to derive physical parameters.