DECELERATED SUB-RELATIVISTIC MATERIAL WITH ENERGY INJECTION

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The emission from KNe has been modeled as the afterglow due to the interaction of the ejecta mass with the surrounding circumburst medium in the non-relativistic regime in timescales of days to several years. Our work provides a model from which these observations may be explained with the added value of a possible energy injection scenario. With basis on the Sedov-Taylor solution in the non-relativistic regime, we have derived the dynamics of the shock front and developed a theoretical model which predicts the synchrotron emission produced by the deceleration of a non-relativistic ejecta mass in a stratified medium with different parametrizations of the ejecta's equivalent kinetic energy, one of which considers energy injection. We have calculated synchrotron cooling break frequencies and the spectral peak flux density, with which we have obtained synchrotron light curves in the fast- and slow-cooling regimes. The model's equations have been left in terms of the stratification parameter k, and the kinetic energy distribution indices α and q. They are ready to be used to describe KNe emission.