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An External Shock Origin of GRB 141028A

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The prompt emission of the long, smooth, and single-pulsed gamma-ray burst, GRB 141028A, is analyzed under the guise of an external shock model. First, we fit the gamma-ray spectrum with a two-component photon model, namely synchrotron+blackbody, and then fit the recovered evolution of the synchrotron vFv peak to an analytic model derived considering the emission of a relativistic blast-wave expanding into an external medium. The prediction of the model for the vFv peak evolution matches well with the observations. We observe the blast-wave transitioning into the deceleration phase. Further we assume the expansion of the blast-wave to be nearly adiabatic, motivated by the low magnetic field deduced from the observations. This allows us to recover within an order of magnitude the flux density at the vFv peak, which is remarkable considering the simplicity of the analytic model. Under this scenario we argue that the distinction between *prompt* and *afterglow* emission is superfluous as both early and late time emission emanate from the same source. While the external shock model is clearly not a universal solution, this analysis opens the possibility that at least some fraction of GRBs can be explained with an external shock origin of their prompt phase.

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