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Characterizing Observed vs Rest Frame GRB Durations MICHAEL MOSS, George Washington University, AMY LIEN TEAM, SYLVAIN GUIRIEC TEAM — The observed durations of GRBs are influenced by two competing factors, namely, the elongation of the durations due to cosmological time-dilation and the underestimation of the durations due to the loss of signal into the background noise (i.e., the "tip of the iceberg effect). We select a set of GRB lightcurves observed by *The Neil Gehrels Swift Observatory* Burst Alert Telescope (*Swift*/BAT) with a range of features (e.g., structure, short and long duration, brightness) and simulate their observed *Swift*/BAT light curve at varying redshifts in order to determine which of the two factors dominates at increasing redshift. Using Bayesian Block analysis to determine GRB duration for the observed and simulated light curves, we find that signal lost in the noise significantly decreases observed durations leading to an underestimation of GRB durations when only time-dilation corrections are applied. We investigate whether the effects can be used to better characterize GRB durations and improve the confidence of their association with collapsars or NS mergers. Furthermore, as information from GRBs are lost in the noise, there is an underestimation of the total energy emitted from collapsar and binary neutron star merger events.

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