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Evidence of extended emission in high-redshift short GRBs

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Short GRBs are unique tools that allow us to study binary neutron star (NS) mergers across all cosmic times. The study of short GRBs at high redshifts is particularly important as it allows us to estimate the typical lifetime of their progenitors, and whether they merged early enough to enrich the universe with heavy elements. In this contribution I will review the high-energy properties of high redshift short bursts ($z>1$) finding evidence of extended emission for the majority of them. I will discuss possible interpretations of the extended emission (from misclassification of these events to instrumental biases) and argue that this subclass of short GRBs with extended emission is likely easier to detect in the distant universe. Our work suggests that, although the number of known short GRBs at $z>1$ is very small, it may be only the tip of the iceberg of a much larger population of undetected high- z events originated from NS mergers which are responsible for the r-process element production in the early universe.

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