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Machine Learning approach to probe Gamma-Ray Bursts as Cosmological Standard Candles

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Gamma-Ray Bursts (GRBs) have been detected to very high redshift (z = 9.4) which make them interesting cosmological probes. In attempts to use GRBs as cosmological standard candles, like Type-Ia supernovae (SNe), many studies have been conducted throughout in recent decades. These studies explore different phenomenological relations, such as the Amati and Yonetoku correlations between the GRB spectral properties and energetics, of which the latter strongly relies on the cosmological model. If GRBs can be used as cosmological standard candles just like Type-Ia SNe, which have been observed only up to z < 2, they can be used to probe evolution of dark energy in the history of the universe. I will explain how to use different machine-learning techniques to constrain GRBs as cosmological parameters and how to estimate redshifts of these bursts.

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