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NICER Magnetar Burst Catalog

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In this paper, we present a comprehensive catalog of magnetar bursts detected with NICER, aimed at characterizing their temporal and spectral properties. This study includes all available NICER observations of known magnetars and two magnetar-like rotation-powered pulsars, covering 7.5 years of data. Using the Bayesian blocks method, we systematically search for rapid flux variations in the light curves to identify bursts. With NICER's large effective area and high timing resolution, we perform detailed timing and spectral analyses, measuring key burst parameters such as T90 duration, fluence, and peak flux. By examining parameter distributions and correlation coefficients, we explore potential relationships between burst properties. Additionally, we compare burst characteristics across different magnetars and magnetar-like pulsars, identifying similarities and differences that may provide insight into their emission mechanisms. This catalog serves as a valuable resource for understanding magnetar bursts, with implications for burst trigger mechanisms and magnetospheric dynamics.

Section

High Energy

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