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Characterizing Fast Radio Burst morphologies in CHIME's Baseband Catalog 2

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Fast radio bursts (FRBs) are millisecond-duration radio transients originating at extra-galactic distances. Their morphologies, the signal's evolution as a function of time and frequency, encode valuable information about their emission physics as well as intervening plasma and magnetic fields. For example, we aim to measure the temporal spacing between sub-bursts, their changes in bandwidth and their asymmetry. This constrains theoretical emission models and provides direct measurements of the column density and clumpiness of ionized matter along the line of sight. Two main streams of data are recorded by the Canadian Hydrogen Intensity Mapping Experiment (CHIME) telescope: intensity at 1ms cadence and raw voltage (baseband) at 2.56 μ s cadence. CHIME recently released its second Catalog of FRBs at intensity resolution, containing over 4500 events. The upcoming Baseband Catalog 2 of CHIME includes a sample of Catalog 2 FRBs, containing over 2000 events, allowing us to study a population of multi-component and complex events. In this talk, I will present our current morphology pipeline using fitburst, a least-squares fitter that uses both exponentially modified Gaussian sub-bursts and a running power law. I will present preliminary results obtained with this pipeline and show correlations between different morphological parameters.

Did you give a contributed talk at CASCA 2026?

No

If you are selected for a poster, would you be interested in giving a short flash talk on your work?

Yes

What is your career level?

MSc

Which keyword describes the area of focus of this talk?

Transients

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