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Fast Radio Burst Alerts : frb-voe and the CHIME/FRB Virtual Observatory Event Service

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Discovered in 2007, fast radio bursts (FRBs) are luminous, millisecond duration radio bursts that have quickly become one of the most fascinating classes of radio transients. The progenitor of FRBs remains a mystery, however, through observations like that of the FRB-like bursts detected from a galactic magnetar, SGR 1935+2154, it has been shown that collaborative efforts from multiple observatories can lead to meaningful constraints on FRB progenitor models. In order to detect, localize, and observe FRBs across many wavelengths, rapid communication between observatories is vital. frb-voe is an open-source low-latency alert service that provides standardized infrastructure through which observatories can communicate FRB detections. A virtual observatory event (VOE) is a machine-readable alert that describes an astrophysical transient event. Virtual Observatory Events (VOEs) have proven to be successful in providing an effective mode of communication, for example, dozens of gamma ray burst follow-ups achieved through the Gamma Ray Coordinates Network. We also describe a specific use-case of frb-voe at the Canadian Hydrogen Intensity Mapping Experiment (CHIME). Over the past 2 years, this service has demonstrated the benefits of frb-voe, as CHIME is an excellent FRB detector, but cannot provide the tightest constraints on localization nor on multi-wavelength observations. Fortunately, through frb-voe, other observatories such as Swift GUANO can perform follow-up observations of FRBs detected by CHIME, potentially providing more information on the progenitor and FRB emission mechanisms.

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