CHIMEFRB VOEvent Service FAQs

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1 How do I connect to the CHIME/FRB VOEvent Service?

The Service requires a (free) active subscription. Subscribers must first fill out a subscription form here where they will provide their details and IP address for their VOEvent broker. The subscription will then be activated by CHIME/FRB and following this the subscriber can run a VOEvent broker to subscribe to the XML stream, or start receiving emails if they opted for that.

2 I just received a VOEvent from CHIME/FRB! Is it an FRB?

Not every alert will represent a true FRB. Because alerts are published in real-time, they are only verified by a human afterwards. To check the status of a particular alert, it is best to reach out to CHIME/FRB by opening a GitHub issue **here**.

3 We found something interesting in our follow-up observations of a CHIME/FRB! What next?

We ask that you cite any CHIME/FRB VOEvents that were used to trigger your observations by their **VOEvent IVORN** and in addition **cite** the usage of the Service with the following statement.

"This research has made use of the CHIME/FRB VOEvent Service." (1)

4 I can't connect to the Service. How can I tell if it's down?

If you are having problems connecting to the Service, you can try these solutions that have been ranked in order of severity/complexity.

4.1 Did you request a subscription?

First, check your records that you have an active subscription. This would have required filling the subscription Microsoft Form which provides a receipt to the email address that filled it.

4.2 Did you allow time for activation?

Second, confirm you have waited at least 3 business days since submitting the Microsoft Form, thereby allowing enough time for CHIME/FRB to activate your subscription

4.3 Is your IP address valid?

Third, check that the IP address of the machine where you VOEvent broker is running is publicly accessible, not blocked by a firewall on the local server, and exactly matches the one you gave in the subscription form.

4.4 Is it a deeper problem?

Fourth, please go to **this GitHub page** and submit an issue in which you fully describe the problem. Be sure to include the following details in the issue.

* Your subscriber details: email address, name, and academic association you gave when filling the subscription form
* Your operating system (e.g. Linux)
* Your VOEvent broker software and version (e.g. Comet v 3.1.0)
* Screenshots or code captures of any messages that your broker reports while trying to subscribe. To obtain detailed diagnostic information, run your VOEvent broker in non-demonized mode and high verbosity. For example, use the `-n` flag with Twisted and the `--verbose` option with Comet.

5 What does the number in the `known_source_name` parameter mean?

You may see an integer reported as the name of the source in a `subsequent` VOEvent, rather than a **TNS** name. This number is an internal event registration number for CHIME/FRB, indicating that the source is not yet public.

6 How do I credit the CHIME/FRB VOEvent service in publications/ATels?

Please be sure to **at least** use the **VOEvent IVORN** when referencing individual FRBs and include the following **citation** statement:

"This research has made use of the CHIME/FRB VOEvent Service." (2)

7 How should I submit issues that I'm having with the service?

We are currently using this **GitHub page** to track issues with the Service. You can search existing issues first to see if your problem, or similar, has already been solved or is being actively investigated. If not, please open a new issue and follow the instructions listed also in section 4.4.

8 Is there a way to know what other telescopes/instruments are using CHIME/FRB VOEvents for follow-up?

The following is an updated list of all observatories, telescopes, and instruments using CHIME/FRB VOEvents.

* *Swift*-GUANO
* Hat Creek Radio Observatory
* VERITAS

9 How can I contact the CHIME/FRB team for quick questions?

Please consult the **GitHub page** first to see if your question has already been answered among previously submitted issues. If not, please add a new one. We are committed to addressing issues in a timely manner.

Parameter	Example Scenario
`dm`	Low-DM targets
`event_type`	Study `AMBIGUOUS` events
`known_source_name`	Trigger on specific repeater FRBs
`pos_error_semimajor_deg_95`,	Estimate chance coincidence probability for observatory FoV
`snr`	High-SNR and low-DM targets for potentially nearby FRBs
`timestamp_utc`,`timestamp_utc_inf_freq`	Trigger to search for temporal coincidences or afterglows
Right Ascension, Declination	Trigger on coordinates in observatory FoV

Table 1: Example thresholding scenarios for individual CHIME/FRB VOEvent meta data. Note that a general follow-up campaign will likely combine several scenarios into one.

10 Does CHIME/FRB issue retractions for spurious events?

Real-time VOEvents are verified by humans only after they have been published. Following human verification, an event may be found to be a false positive signal, for example due to RFI contamination. While the real-time FRB detection pipeline performs multiple levels of RFI excision, it is not a perfect filter.

Under the current regime, once per day around 22:00 Pacific Standard Time we will publish `retraction` VOEvents in bulk for all false positives classified in the previous 24 hour period.

11 How precise and accurate is the localization region in the VOEvent?

The real-time localization is reported as an on-sky circle in celestial coordinates. The precision and accurcy of this circular region is sensitive to whether the FRB was detected in one beam or multiple beams.

11.1 Precision

Multi-beam FRB detections typically come with the least precise real-time localization. The error radius can be as large as 1° to 2°, and in some rare instances much larger. Typically the worst localizations are for events that later turn out to be RFI that was detected in many beams.

Single-beam FRB detections are typically circular regions with a radius equal to half the detection beam width at 600 MHz, which is about 0.5°. However, it can be much better in some instances, as low as $\sim 10'$.

11.2 Accuracy

The accuracy of real-time localizations has been evaluated and described in CHIME/FRB Collaboration et al., 2019[1], using the method of pulsar analogues.

12 Which FRB parameters are most important?

Every subscriber has constructed a potentially unique follow-up campaign. For instance, one may be interested in low dispersion measure (DM) FRBs, while another is interested in follow-up of specific known repeating FRBs. For that reason, the FRB parameters of import vary from one campaign to the next. Table 1 offers a launch point for considering what FBR parameters may be important for a campaign.

[1] https://arxiv.org/abs/1908.03507