RFI Database Contest

What is asked?

The contestants are asked to submit simulated signals in IQ format, mimicking typical RFI signals affecting microwave remote sensing instruments.

The submission package shall include a set of simulated digitized complex samples in baseband (I/Q signal). These signals shall be provided either in Matlab MAT format (v7.3 HDF5), or binary format (Little-endian, interleaved float32 I/Q samples in a raw binary file, without header).

Metadata shall be provided in a separate text file. The following list of signal attributes must be provided:

- Dataset Name
- Sample Spectrogram Image (visualization of the signal in PNG format)
- Interferer Type (Narrowband, Pulsed, Chirp, FSK modulation…)
- Baseband Sample Rate
- Total number of samples
- Intended RF Band (MHz): The frequency band the baseband simulated signal is meant to represent
- Dataset Provider: Name and organization of the dataset originator
- License: CC BY-SA 4.0
- Citation Format: A recommended citation including DOI (if available) or proper referencing

Data streams shall be of the order of a few seconds in length. This is to accommodate typical integration times used in passive microwave radiometry (e.g. SMOS 1.2 seconds). Baseband bandwidth is discretionary, but it is encouraged to follow typical instrumental bandwidths covering the ITU allocations.

In addition, a brief description of the methodology must be provided in PDF format (English language), along with the citation of any data source used. Moreover, the code or models used can also optionally be provided for reproducibility and traceability purposes (in MATLAB or Python).

Submissions should be licensed under the Creative Commons BY-SA license and will be made available (upon curation) in an RFI repository maintained by FARS. Authors will retain full license rights, and their contributions may be referenced, adapted, or expanded upon by the research community, provided proper attribution is given.

Submission channel:

The submission package (.ZIP) shall be submitted to:

fars_chairs@grss-ieee.org

Schedule

- **Submission Deadline:** 20th November 2025

- **Winners' announcement:** 20th December 2025

Prizes

The first and second-ranked teams will be recognized as winners. The winning teams will:

- Present their contributions in a dedicated RFI session at IGARSS 2026
- Receive IEEE Certificates of Recognition
- Be awarded during IGARSS 2026 Technical Committee luncheon (TBC)

Who will evaluate the entries submitted to the contest?

An evaluation board composed by FARS Chair and Co-Chairs and other FARS TC members with expertise on the various types of submissions to the contest (e.g., passive or active sensor, frequency band, particular application of the measurements).

Selection Criteria

The criteria for selection, in order of importance, will be:

1. **Relevance to the Microwave Remote Sensing and RFI Communities**
    - Simulations of signals known to interfere with relevant microwave bands will be prioritized over generic signals lacking observational data or well-supported assumptions. For example, out-of-band radar pulses are a well-documented source of RFI in the passive L-band (1400-1427 MHz).
    - Preference will be given to simulations based on real-world measurements, official specifications, or scientific literature. When observational evidence is limited, the soundness of the assumptions used in the simulation will be considered. For instance, a simulation mimicking L-band radar navigation signal affecting the passive band should match real-world parameters such as frequency, pulse repetition, and modulation.
    - Typical instrumental parameters in the microwave remote sensing will be valued. For example, realistic radiometry sample rates, etc.
2. **Data Availability and Traceability**
    - Preference will be given to simulations that offer comprehensive documentation of the methodology followed, including details on processing steps, and any transformations applied. A clear methodology, outlining key assumptions, models used, and parameter selections will also be valued.
3. **Novelty and Scientific Contribution**
    - Submissions that introduce new insights, methods, or signal types that have not been widely studied in the context of RFI will be given additional consideration.
    - Innovative approaches to modeling RFI may also be valued.
4. **Reproducibility**
    - Preference will be given to submissions that are reproducible, meaning that other researchers can generate similar results using the provided methodology

and datasets. Providing the code used to generate the data will not be required, but it could add value.