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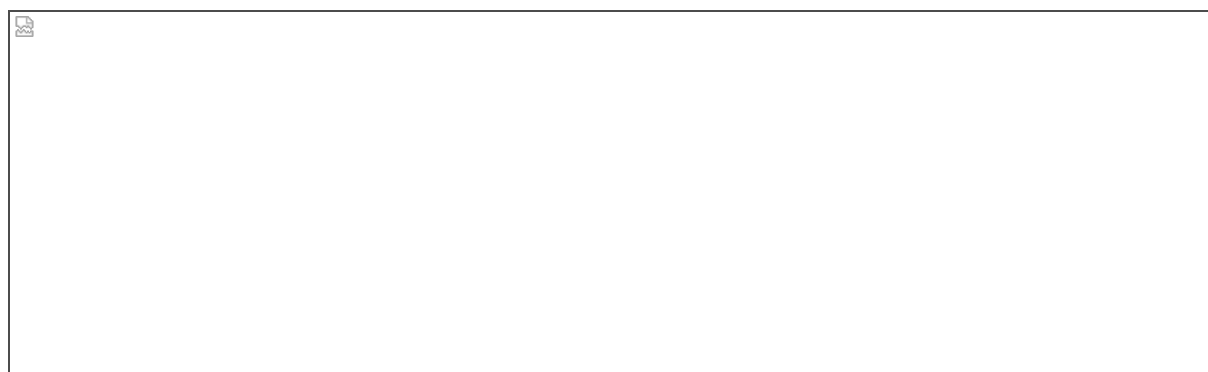
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# JSON Implementation of Time-Frequency Radio Catalogues: TFCat

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In the low frequency domain, the electromagnetic signatures are tracers of energetic and unstable particle populations rather than atomic and molecular transitions. Such signatures are identified with their spectral-temporal shape in time varying spectrograms. Figure 1 shows a spectrogram including Solar radio bursts (related to energetic electron beams escaping from the Sun) and terrestrial auroral kilometric radiation (related to the magnetospheric activity), observed by the Cassini/RPWS instrument during its flyby of the Earth.



**Figure 1:** Low frequency radio spectrogram (Wind/Waves) with solar and terrestrial natural radio emissions.

A corpus of catalogues identifying and documenting such radio signatures have been published since the 70's, but there was no standard exchange format, leading to difficulties in sharing and reusing such catalogues.

TFCat (Time-Frequency Catalogue) is a data interchange format based on JSON. It defines several types of JSON objects and the manner in which they are combined to represent data about time-frequency features of a time spectrogram (a.k.a. dynamic spectrum), their properties, and their temporal and spectral extents. This implementation is inheriting from the GeoJSON file format [RFC7946].

In the past two years, several catalogues have been published using the TFCat format, and tools are now implementing interfaces on top of this specification, for labelling observations, displaying catalogues, or even using the catalogue shapes to select and process observational data.

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## Discussion