

# Discovery, description and access of Radio data in the VO. Status report

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on behalf of Radioastronomy Interest  
Group



# RIG standard production : 3 notes

- [Radio astronomy in the VO: services implementation review](#),  
Version 1.1, IVOA Note 19 November 2021
- « [ObsCore extension for visibility data](#) » becoming  
« [ObsCore extension for Radio data](#) »
- New : « [Pulsar FRB radio data discovery and access](#) »  
Version 1.0 , IVOA note 22 September 2022
- The two last notes belong to DAL/DM for discovery and access
- It's ongoing and somewhat preliminary work. No surprise if you find mistakes !



# ObsCore extension for Radio data

(François Bonnarel, Mireille Louys, Baptiste Cecconi, Vincenzo Galluzzi, Yan Grange, Mark Kettenis, Mark Lacy, Alan Loh, Mattia Mancini, Peter Teuben, Alessandra Zanichelli)

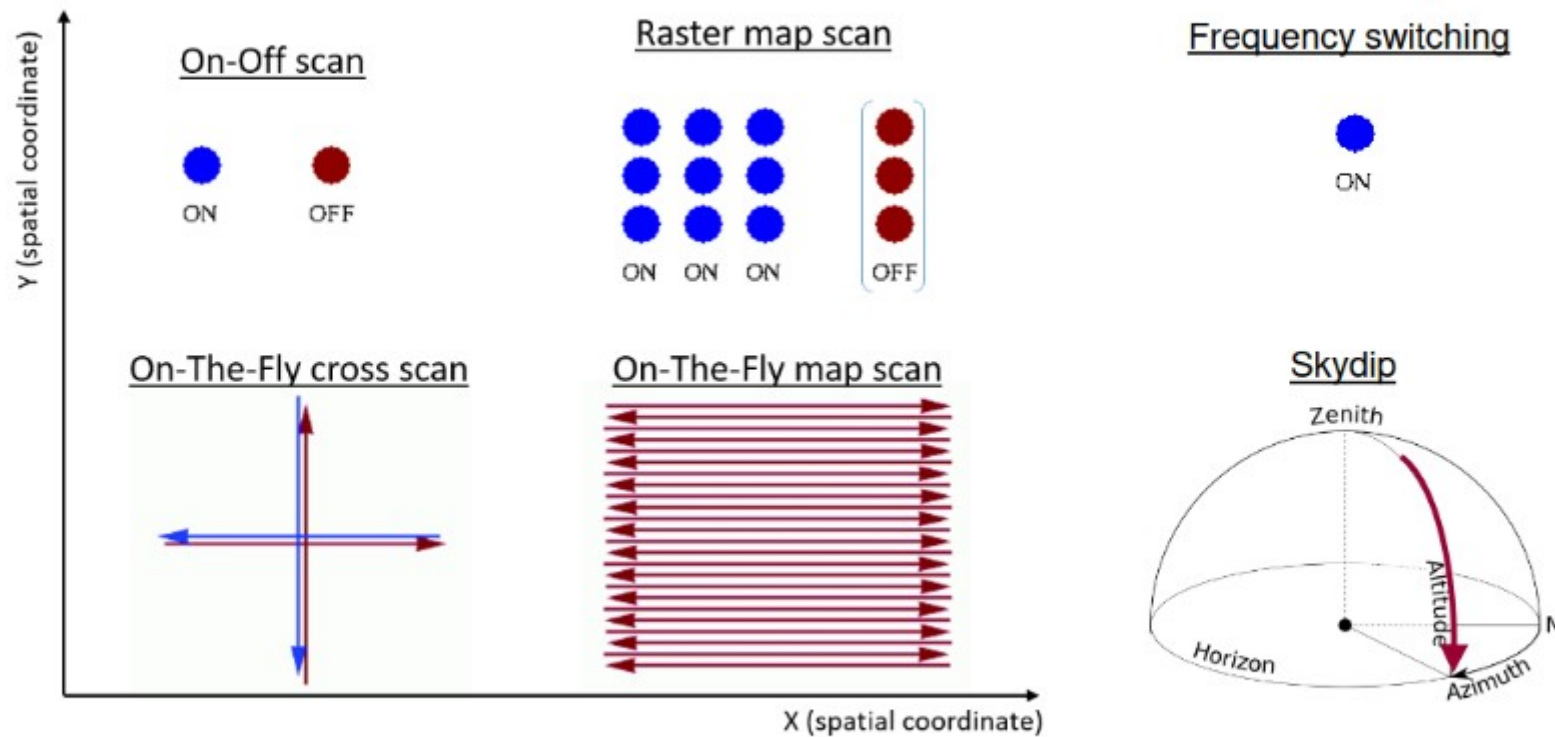


Figure 1: Single Dish Observation Sky scan modes



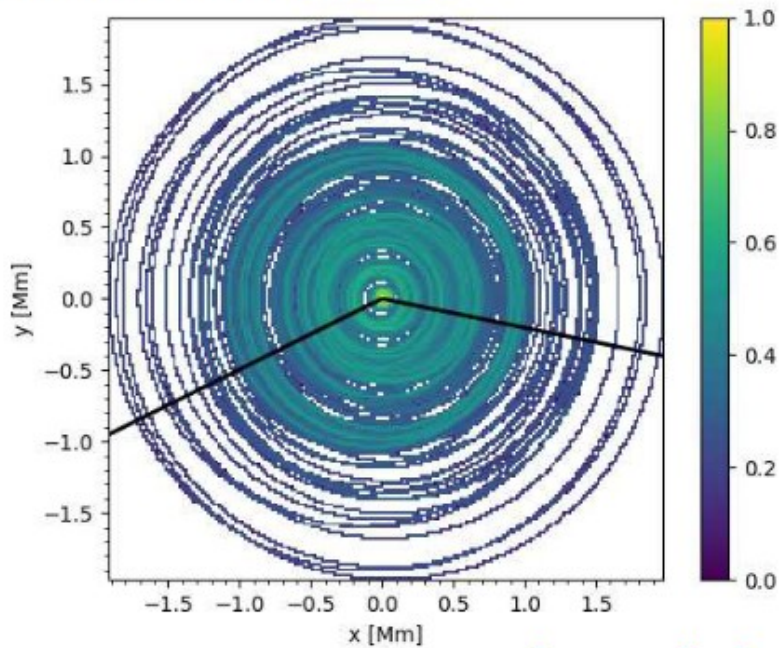


# ObsCore extension for Radio data

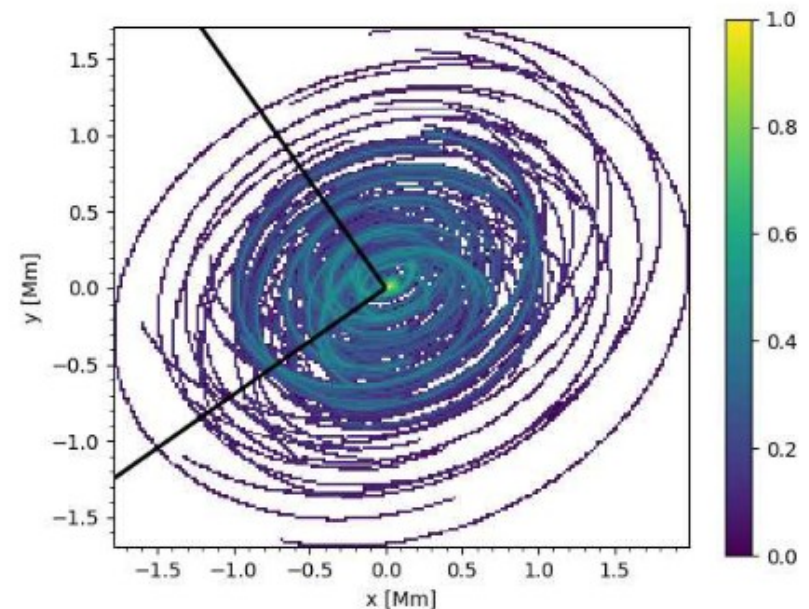
(François Bonnarel, Mireille Louys, Baptiste Cecconi, Vincenzo Galluzzi, Yan Grange, Mark Kettenis, Mark Lacy, Alan Loh, Mattia Mancini, Peter Teuben, Alessandra Zanichelli)

## Interferometry uv coverage maps :

In a well behaved case



In a more common case



[https://git.astron.nl/virtualobservatory/lofar\\_uvw\\_generator](https://git.astron.nl/virtualobservatory/lofar_uvw_generator)



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- We had a version last year adding specific attributes for interferometry
- Some of them really describing uv coverage, or instrumental arrays aspects
- Some others (`f_min`, `f_max`, `s_fov_min`, `s_fov_max`) where generic radio proposals
- We still discuss `uv_dist_min`, `uv_dist_max`
- We still discuss if `f_min/f_max` have to be part of the extension or results of a udf.



# ObsCore extension for Radio data

(François Bonnarel, Mireille Louys, Baptiste Cecconi, Vincenzo Galluzzi, Yan Grange, Mark Kettenis, Mark Lacy, Alan Loh, Mattia Mancini, Peter Teuben, Alessandra Zanichelli)

- We had several meetings for single dish data :
  - how to discover single dish data with their specificities.
  - Tackle sky scanning modes ?
- New version proposes
  - general radio attributes,
  - interferometry/visibility specific attributes and single dish specific attributes
- Please comment on github before this becomes an ivoa note
- Should we promote this as an endorsed note or a recommendation ?





# Pulsar and FRB Radio Data Discovery and Access

(Alessandra Zanichelli, Ada Nebot-Gomez, Brent Miszalski, Mireille Louys, Alan Loh, Mark Lacy, Jean-Matthias Griessmeier, Yann Grange, Vincenzo Galluzzi, Mark Cresitello-Dittmar, Baptiste Cecconi, François Bonnarel)

- Pulsar and Fast radio bursts
  - Specific radio time dependant data
  - We had several meetings/presentations on that during 2021/2022
- How do we describe specific radio data in PSRFITS or filterbank ?
  - Mapping PSRFITS keywords to ObsCore
  - Mapping filterbank keywords to ObsCore
  - Specific additions for radio (f\_resolution, f\_min...)
  - Specific additions for time (folded mode, time sampling...)
  - Specific instrumental/observations provenance features (tracking mode, frontend+backend).



# Pulsar and FRB Radio Data Discovery and Access

(Alessandra Zanichelli, Ada Nebot-Gomez, Brent Miszalski, Mireille Louys, Alan Loh, Mark Lacy, Jean-Mathias Griessmeier, Yann Grange, Vincenzo Galluzzi, Mark Cresitello-Dittmar, Baptiste Cecconi, François Bonnarel)

- Discovery via ObsCore table :
  - ObsTAP
  - Dataset Acces Protocol (extension of SIA, parameter based)
- Discovery via joint source + obscore details
- Discovery via sources in catalog and DataLink
- Access :
  - Full retrieval
  - extraction/transformation (SODA-like): time series , phase plots, dynamic spectra
- This is more like an implementation note





# Radio astronomy in the VO: services implementation review

- One year old : already to be upgraded for 2022A. Not done yet
- Missing projects :
  - SKA
  - IRAM/NOEMA efforts
  - NRAO TAP and Jupyter Notebooks
  - LMT
  - GBT
  - Meerkat galactic center Mosaic HiPS



# Radio astronomy in the VO: services implementation review

- Evolution to be described :
  - ASTRON : ARTS (FRB) and LOTSS-DR2
  - JIVE : ObsTAP for visibility data new service
  - ALMA : SIA/ObsTAP now provide DataLink access
  - ? ASKAP, MWA ?
  - ? INAF ?
  - ? Nançay ?
  - ? CADDC ?
- To be completed in next roadmap

