Radio Fundamental Catalogue

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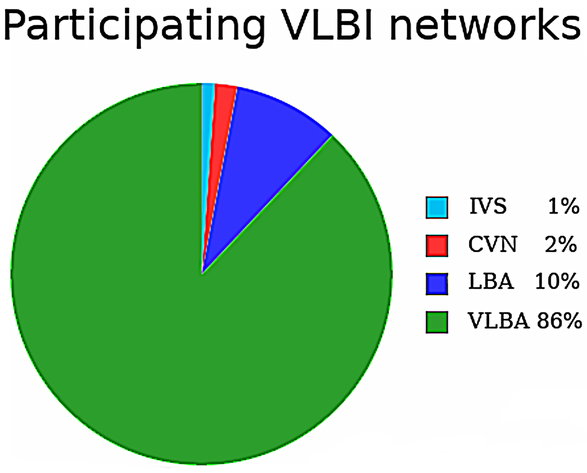
Present status:

- The Radio Fundamental Catalogue (RFC) is **the most complete absolute astrometry catalogue** based on VLBI observations. It **uses** all publicly available VLBI data, including those used in prior publications, like icrf2, vcs-ii, etc:
  - 22 absolute astrometry VLBI campaigns in 1994–2017
  - 546 absolute astrometry VLBI observing sessions
  - 6144 geodetic VLBI observing sessions
  - 14098022 group delays
- All absolute astrometry observing sessions were analyzed at the **visibility** level.
- The RFC **provides**
  - positions of **13661 sources** (13647 AGNs and 14 radio stars)
  - milliarcsecond scale maps of 9287 sources
  - correlated flux densities

Observations:

Participating VLBI networks



Observed band:

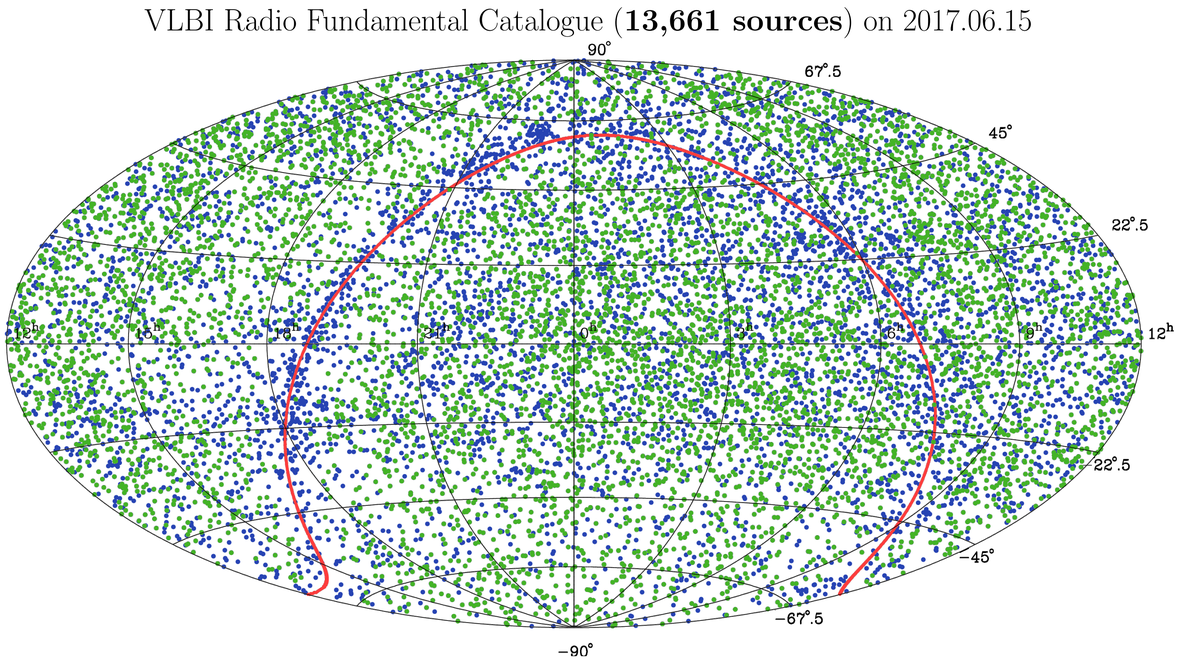
Dual-band:	55%
8 GHz	33%
5 GHz	10%
22 GHz	2%
2 GHz	1%

Numb of sessions per source

1	45%
1–2	77%
1–5	90%
10+	8%
100+	3%

Source distribution:

VLBI Radio Fundamental Catalogue (**13,661 sources**) on 2017.06.15

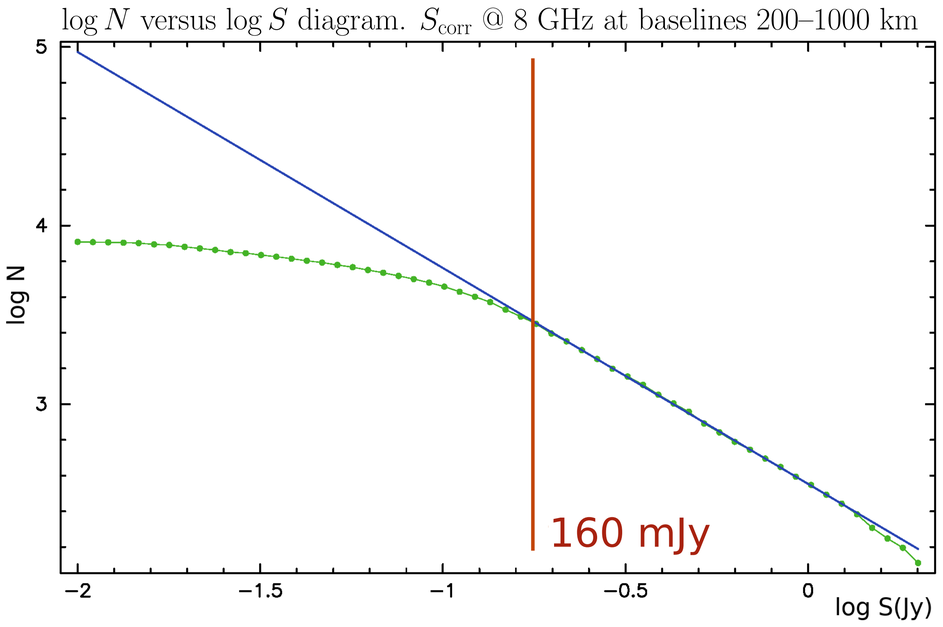


Green: 7,223 VLBI/Gaia matches $P < 0.0002$

Blue: VLBI sources without Gaia matches

RFC completeness:

$\log N$ versus $\log S$ diagram. $S_{\rm corr}$ @ 8 GHz at baselines 200–1000 km

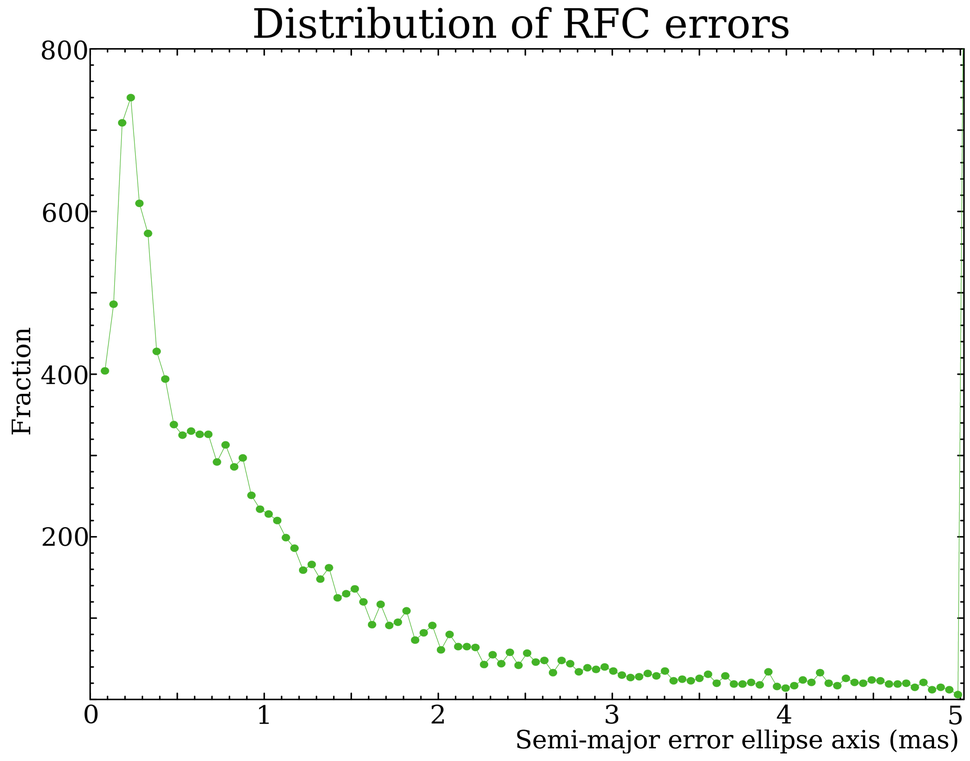


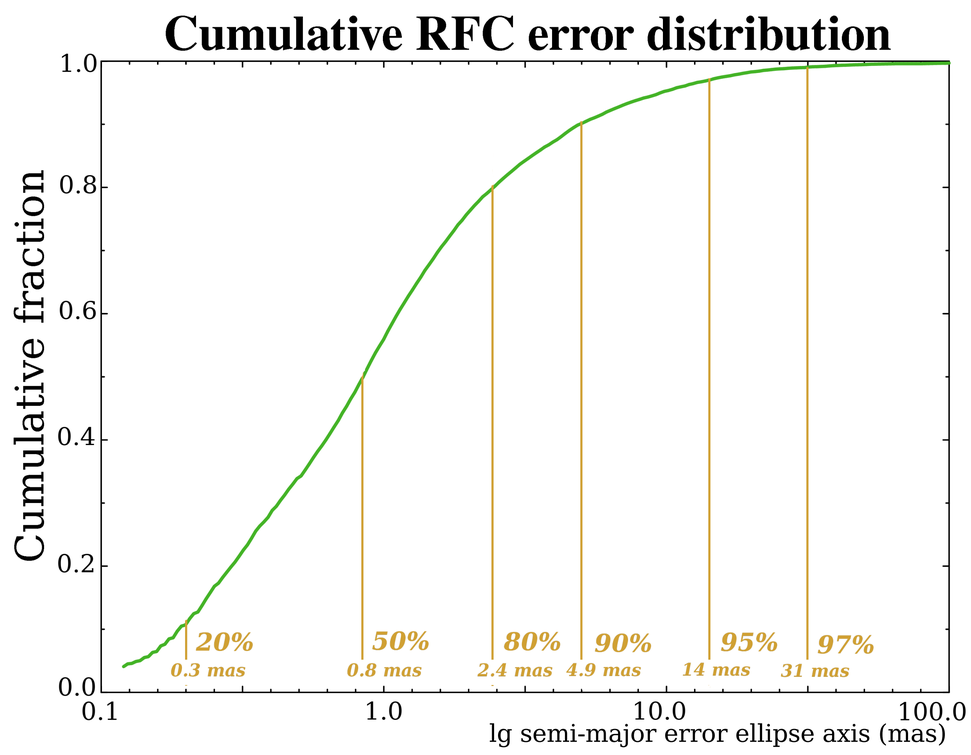
170 mJy	100%
160 mJy	98%
150 mJy	95%
100 mJy	82%
50 mJy	52%
10 mJy	11%

Number of matches:

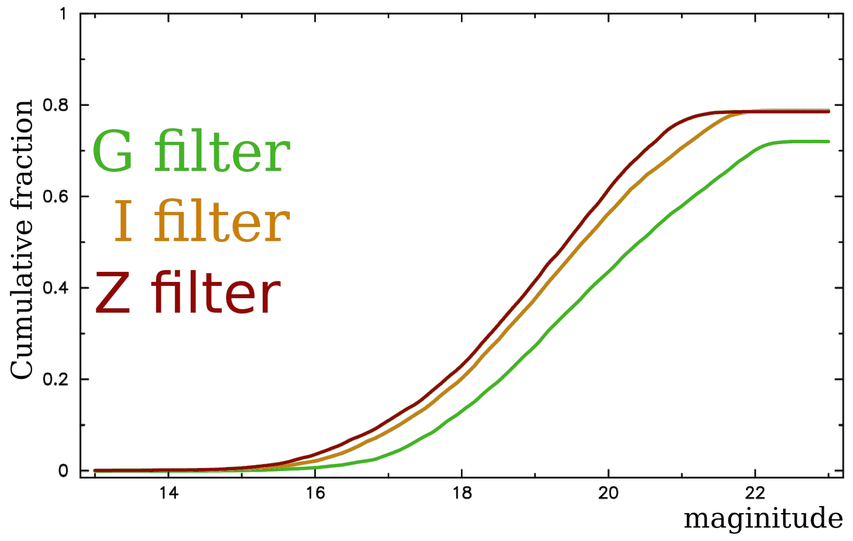
γ-ray	Fermi:	13%
X-ray	Chandra	3%
infra-red	WISE:	74%
infra-red	2MASS:	36% (point sources)
infra-red	2MASS:	11% (extended sources)
optic	Gaia:	53%
optic	PanSTARRS:	71%

Position errors:



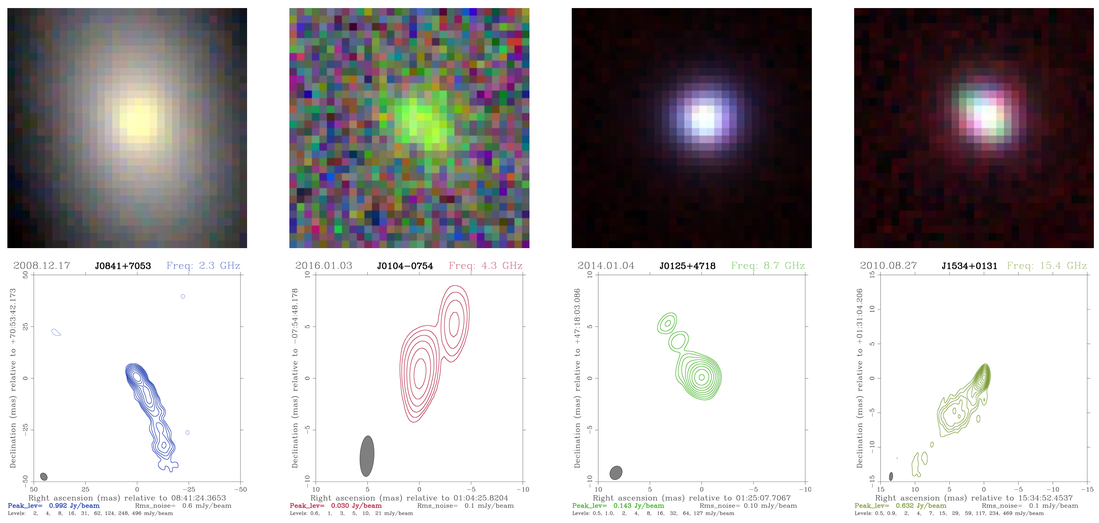


Comparison with Pan-STARRS catalogue:



9633 RFC/PS matches

Flt	share	compl mag
g	72%	22.0
r	76%	21.8
i	79%	21.6
z	78%	21.0
y	74%	21.0



Summary:

The RFC is based on **all** publicly VLBI visibility data (over 60 Tb). The RFC 2017a has a factor of 4 more sources than the previous accumulative catalogue ICRF-2. **The RFC replaces ICRF-2/ICRF-3**. On 2017.06.15, there are 3634 new sources in the processing queue. The catalogue is updated on a quarterly basis. The catalogue is expected to have over 15,000 sources in H2 2017.

The RFC is available on-line at **http://astrogeo.org/rfc**.