



The astrometric feasibility and accuracy of VERA

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Test observations (QSO pair)

	Target	Reference	SA	PA	epochs
1	J2218-0035	3C446	2.20	125	8
2	J1808+4542	OU+401	1.47	90	3
3	J0831+0429	OJ038	2.0	50	3
4	NRAO512	3C345	0.5	80	15

Observations

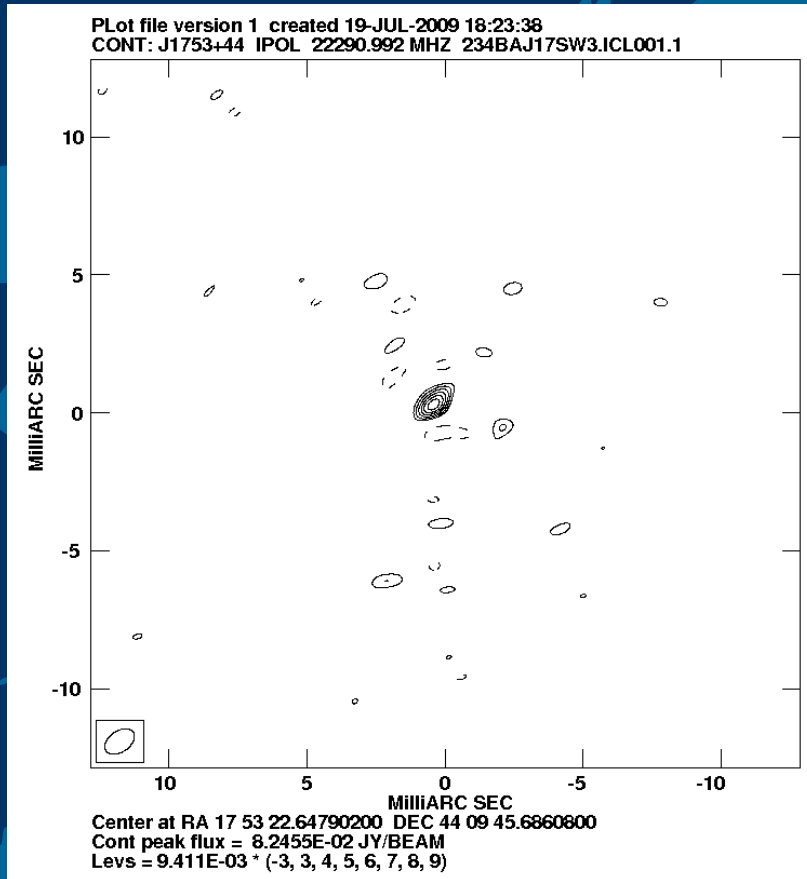
- Date 2004/11/~ 2009/2
- Band K band
- DIR2000(1Gbps, 16MHz*16) (all epoch) – VERA terminal
- DIR1000(128Mbps, 16MHz*2) (2005/5/24) – VSOP terminal

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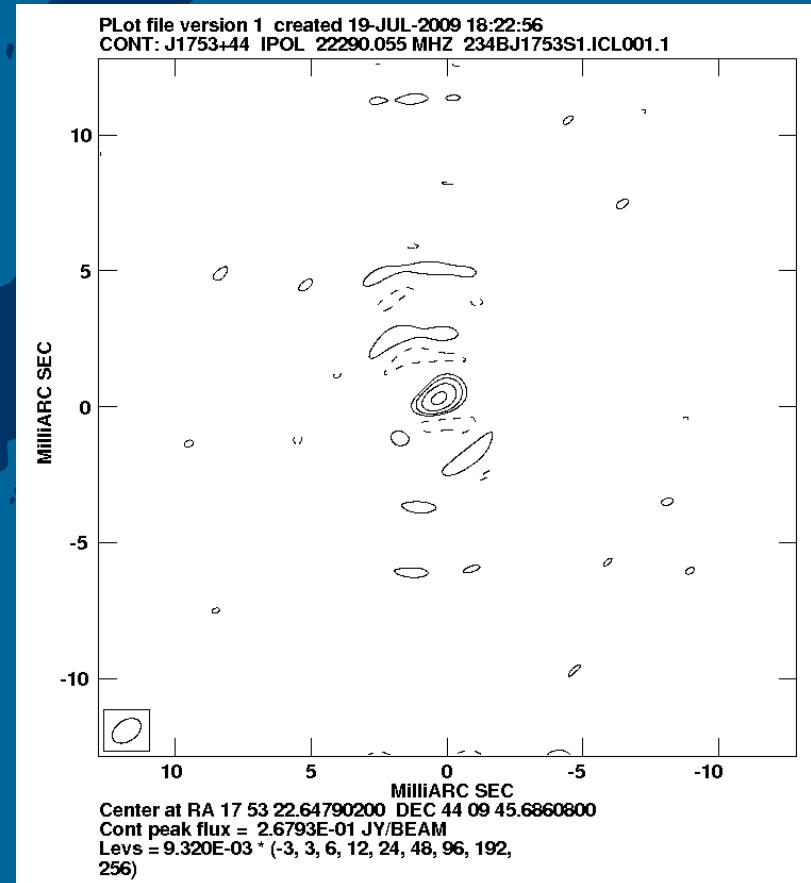
(Verification of VERA using QSO pairs)

- **Introduction of 2beam and 1Gbps correlator system**
- **Comparison of apriori models**
- **Comparison of different correlators**
(VERA Corr and K4 Corr developed by NICT)
- **Test observations**
 - Multi epoch QSO pair observations
 - Comparison between 2beam and single beam switching observations
- **Unresolved issues**
(Short period phase fluctuations(several 10min),
different accuracies between toward R.A and Dec.)

Test Observations (2 beam VS Single beam switching)



J1753+4409 (Switching)
Peak Flux: 82.5 mJy

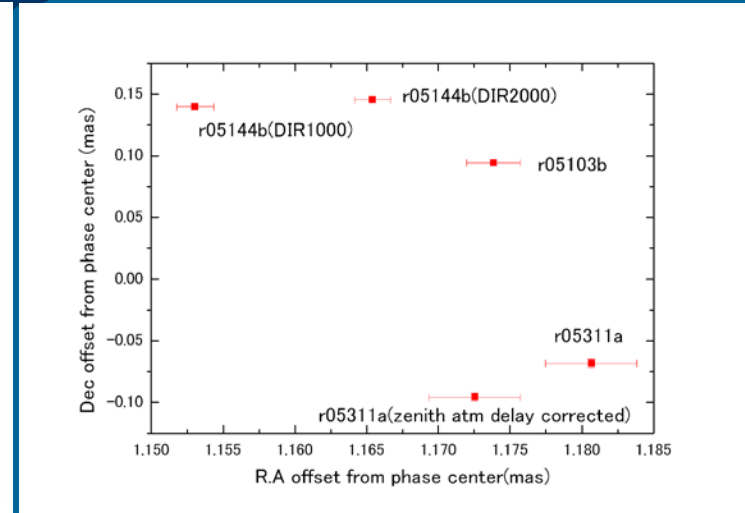
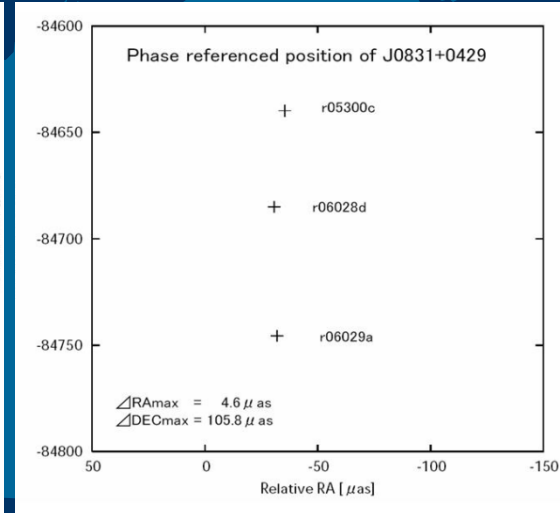
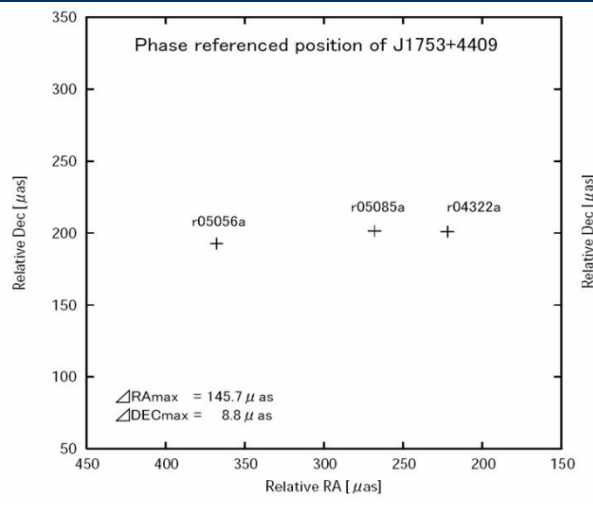


J1753+4409 (2beam)
Peak flux: 267.9 mJy

The difference of Positions between 2beam and switching
RA. $118 \pm 50 \mu\text{as}$, Dec. $-4 \pm 50 \mu\text{as}$ (2beam-switching)

Test Observations (Astrometry)

• By way of checking a priori models and correlator system, astrometric observations are considerable



OU+401&J1753+4409

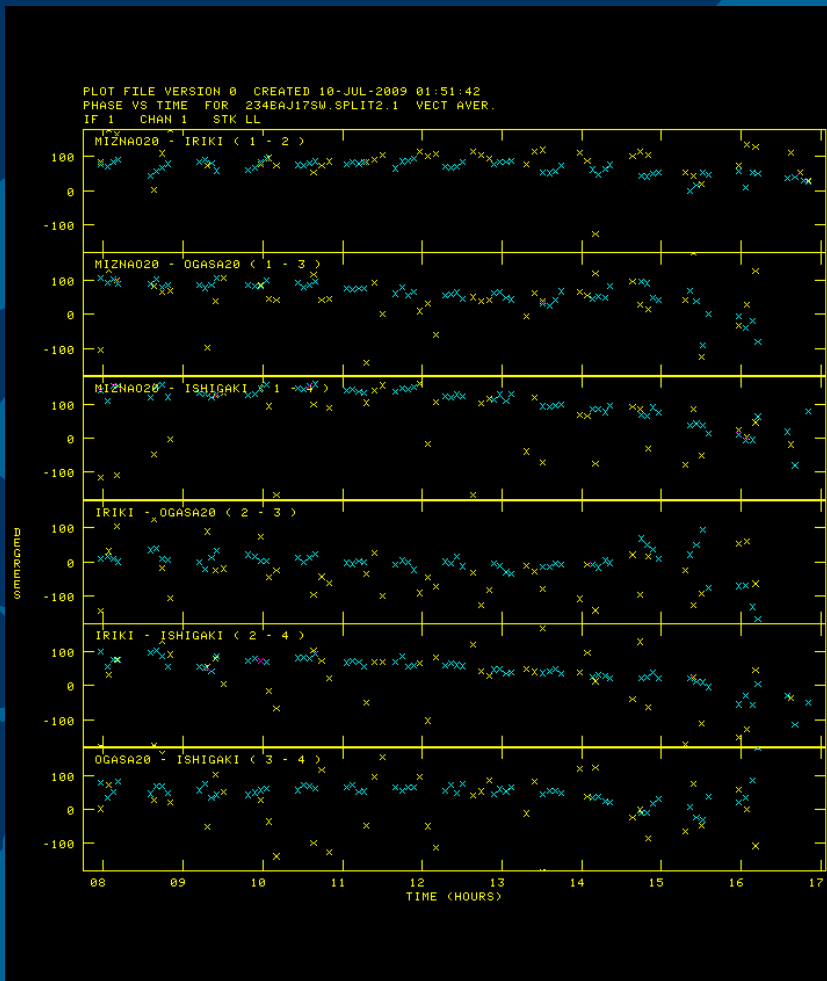
OJ038&J0831+0429

3C446&J2218-0335

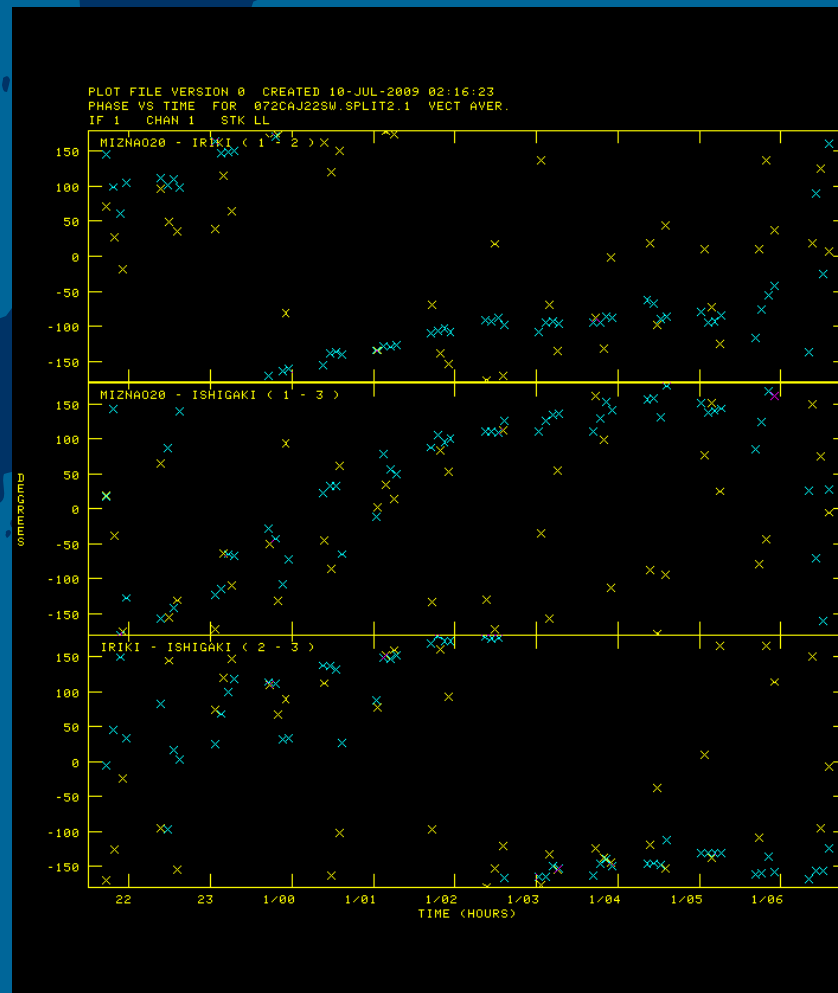
The accuracy of the direction of R.A is very high (about 10 μ as). But the direction of Dec is a little bad. Mainly due to a priori model error and zenith atm delay offset?. The directions of offsets may be dependent on PA.

1. To more improve the astrometric accuracy, improvement and verification of geophysical models (ex., plate motion, ocean tide loading, non-tidal ocean loading, etc.) are considerable.
2. Moreover, we have to estimate the atmospheric zenith delay offset and apply the most accurate geophysical models.

Test Observations (2 beam VS Single beam switching)



Phase referenced visibilities
J1753+4409(Target)



Phase referenced visibilities
J2218-03(Target)

Yellow: Single beam , Blue : 2beam