

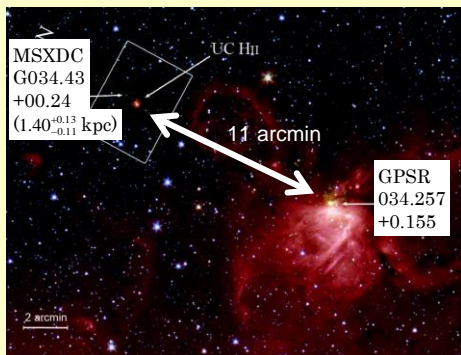
Parallax Measurements of a star-forming region GPSR 034.257+0.155

Tomoharu Kurayama (Teikyo University of Science)

We have observed a star-forming region GPSR 034.257+0.155 with VERA in order to measure its annual parallax. The tentative value of annual parallax is 0.41 ± 0.09 mas, which corresponds to the distance of $2.44^{+0.69}_{-0.44}$ kpc. The parallax varies from 0.319 mas to 0.510 mas by changing the data points using the parallax fitting. The kinematic distance is 3.7 kpc, which corresponds to the parallax of 0.27 mas. The smallest annual parallax is consistent with the kinematic distance. We also try to develop a new method for the determination of the position at each epoch, using the sidelobe peaks of the dirty images.

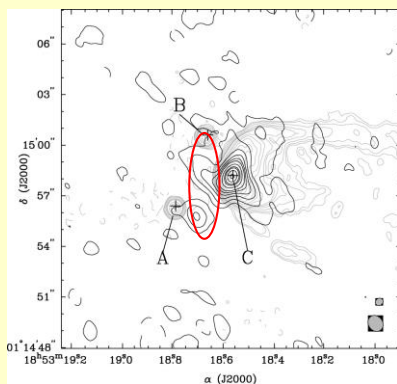
1. Introduction

- Around GPSR 034.257+0.155 • Another star forming region MSXDC G034.43+00.24 lies by 11' from GPSR 034.257+0.155.
- The distance of MSXDC G034.43+00.24 is given by the parallax measurement with VERA, $1.40^{+0.13}_{-0.11}$ kpc.



GLIMPSE four-color (3.6, 4.6, 5.8, 8.0 um) (Shepherd+ 2007)

- GPSR 034.257+0.155



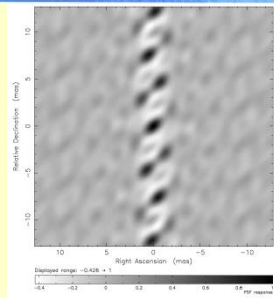
- Radial velocities and kinematic distances are same for both sources:
 - radial velocity: 58 km/s
 - kinematic distance: 3.7 kpc

- A, B : hyper-compact H II regions
- C : H II region
- Component D aparts 10" from the figure.
- H₂O masers are detected from the red area

Black : Dust continuum from BIMA 2.8 um
Gray : Free-free radiation by VLA 2 cm
(Mookerjee+ 2007, Sewilo+ 2004)

2. Observation

- VERA four stations
- H₂O maser (22 GHz)
- Phase-referencing VLBI observations
- Term : 2006/5~2008/6
- Thirteen dates
- Large sidelobes caused by low declination (+1°)

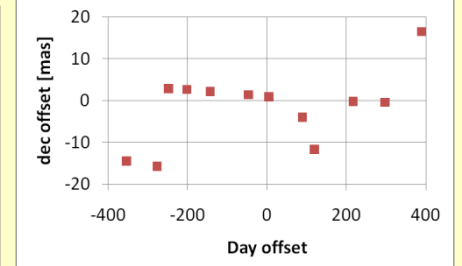
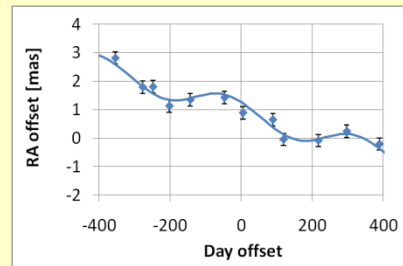
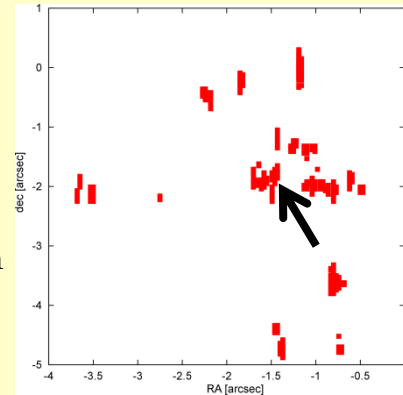


Synthesized beam on 2006 may 23 (r06143c). We found large sidelobes in the declination direction, caused by low declination.

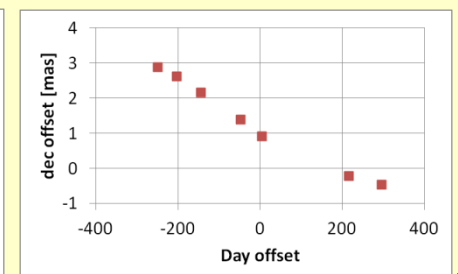
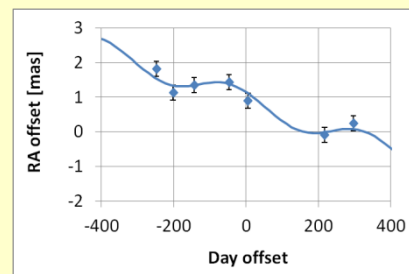
obs. Name	obs. date
r06143c	2006 May 23
r06220a	2006 Aug 08
r06249a	2006 Sep 06
r06295a	2006 Oct 22
r06354b	2006 Dec 20
r07023e	2007 Jan 23
r07085b	2007 Mar 26
r07137b	2007 May 17
r07221a	2007 Aug 09
r07251a	2007 Sep 08
r07349a	2007 Dec 15
r08064b	2008 Mar 04
r08156a	2008 Jun 04

3. Distribution and Motions

- Distribution of masers (Right)
 - The region of peak SNR > 7 in the imaging of 0.5×0.5 arcsec on 2006 May 23.
 - We have the possibility of maser spots in these regions.
 - The brightest feature, shown by an arrow in the right figure, is used in the following fittings.
- Fitting with RA data only
 - parallax 0.41 ± 0.09 mas (tentative), distance $2.44^{+0.69}_{-0.44}$ kpc

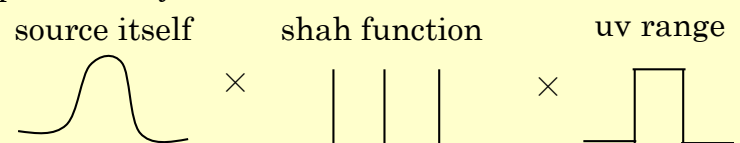


- Fitting with RA data only lying in the dec trend
 - parallax 0.32 ± 0.13 mas, distance $3.13^{+2.26}_{-0.92}$ kpc
 - Consistent with the kinematic distance of 3.7 kpc

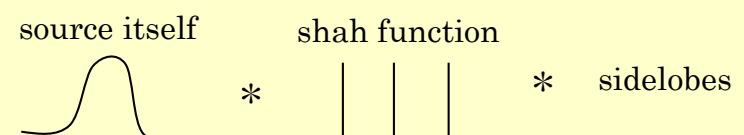


4. Discussion

- In the declination direction, the UV (visibility) data is approximately



- In the image domain, the Fourier transform of above appears:



- Sidelobes in the dirty image may have some information about the source position....