

# VLBI Observations and NH<sub>3</sub> Mapping of the Star-forming Region NGC2264

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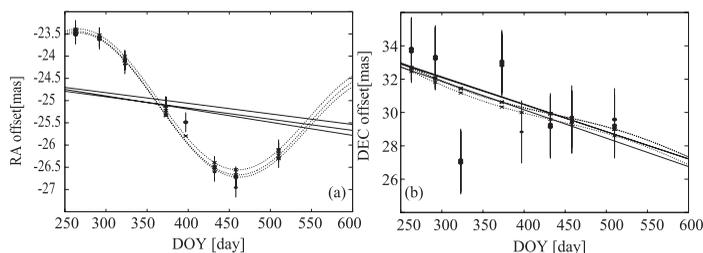
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**Abstract.** We have measured the annual parallax of the water maser source associated with star forming region NGC2264 from observations with VLBI Exploration of Radio Astrometry (VERA). We detected masers at  $V_{\text{LSR}} = 7.2 \text{ km s}^{-1}$ . We discussed its driving sources of detected maser spots. One of the maser spots was associated with a centimeter continuum source observed with VLA. Neither optical, infrared nor X-ray sources is catalogued near the spot. The other maser spot is located close to an X-ray source, although there is no optical or infrared counterpart. The proper motion of the former spot was  $(\mu_{\alpha}, \mu_{\delta}) = (23.91 \pm 4.29, -29.81 \pm 4.27)$  and the proper motion of latter spot was  $(\mu_{\alpha}, \mu_{\delta}) = (-0.96 \pm 0.58, -6.05 \pm 3.06)$ . For the latter spot, the peculiar motion is  $\sim 150 \text{ km s}^{-1}$  and it has the high velocity and this may be a jet or an outflow from a young star. The observed parallax is  $1.365 \pm 0.098 \text{ mas}$ , corresponding to the distance of  $738_{-50}^{+57} \text{ pc}$ . This value is constant with the photometric distance of NGC2264 previously measured. The fitting result of the parallax is shown in figure 1. We also observed in NH<sub>3</sub> (1,1), (2,2), (3,3) lines of NGC2264 with the Kashima 34m telescope. We estimated the star formation efficiency (SFE) of NGC2264 from the dense molecular mass of NH<sub>3</sub> and the stellar mass calculated by Teixeira *et al.*(2012). The SFE is 9 – 12 % which is consistent with previous results.

**Keywords.** stars: formation — ISM: individual (NGC2264) — astrometry



**Figure 1.** The fitting of the parallax.

## References

Teixeira, P. S., Lada, C. J., Marengo, M., & Lada, E. A. 2012, *A&A*, 540, A83