

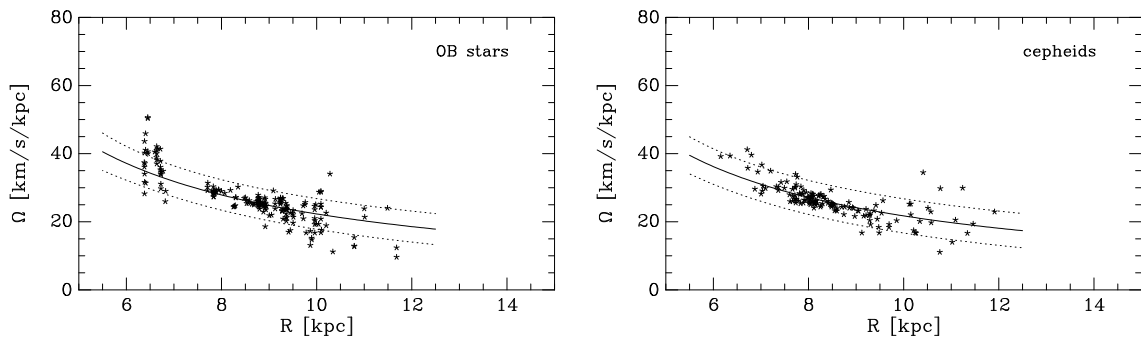
# Proper Motion Study of the Galactic Rotation Curve

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The outer rotation curve of the Galaxy has been determined previously by Brand & Blitz (1993) using HII regions embedded in molecular cloud complexes, whereas Pont et al. (1994) derived the rotation curve using new radial velocities of classical cepheids. Radial velocities are converted to circular velocities assuming that the objects move on circular orbits around the galactic center.

Obviously proper motions of the stars may provide independent information on the rotation curve. Recently the PPM Star Catalogue has been compiled at the Astronomisches Rechen-Institut which is well suited as a broad data base for proper motions of high accuracy. We have been able to identify 144 cepheids and 197 OB stars associated with 59 HII regions in the PPM, covering galactocentric distances from 6 to 12 kpc. Assuming  $R_{\odot} = 8.5$  kpc we find an angular velocity of the LSR of  $5.5 \pm 0.4$  mas/a (OB stars) and  $5.4 \pm 0.5$  mas/a (cepheids) in perfect agreement with the IAU value of 5.5 mas/a corresponding to a circular velocity of 220 km/s.

The rotation curves resulting from the full space velocities are shown below. The rotation law corresponding to a flat rotation curve or  $\Omega(R) \propto 1/R$  and error estimates are indicated. The shape of these rotation curves is tightly correlated with the shapes of the rotation curves determined using either only radial or tangential velocity components, respectively. Even small scale irregularities are reproduced such as the deviations from circular rotation of the OB stars in the Perseus spiral arm.



## References

- Brand, J. and Blitz, L., 1993, A&A 275, 67  
Pont, F., Mayor, M. and Burki, G., 1994, A&A 285, 425