

THE BASIC STATE OF THE VELOCITY FIELD IN THE GAS CLOSE TO THE GALACTIC CENTRE

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To explain the features in the range  $340^\circ \leq l \leq 22^\circ$  which show expansion velocities, elliptical stream-lines have been proposed that happen to expose expansion components towards the sun. Three general observations, however, make this interpretation doubtful:

- i) No case of a contraction velocity with respect to the galactic centre is found (the  $+40 \text{ km s}^{-1}$  feature in the 21-cm absorption data in the direction of the galactic centre is probably closely connected to it (cf. Schwarz *et al.* *Astron. and Astrophys.* 54, 863).
- ii) The average radial density distribution of all major observed constituents of the interstellar gas shows a large deficit in the distance range  $300 < R < 3500 \text{ pc}$ , while the distribution for  $R > 6 \text{ kpc}$  resembles an exponential disk.
- iii) Each observed expansion feature requires another special set of parameters for the ellipticity and orientation of the stream-lines. We therefore propose an axially symmetric expansion velocity field in the gas, which can be approximated by

$$\Pi(R) = 484 (R/\text{kpc}) \exp \{-0.93 (R/\text{kpc})\} \text{ km s}^{-1}$$

This expansion field may be considered as a description of a galactic wind. If it remains time-independent, then this velocity field depletes the gas within 3.5 kpc in about  $5 \times 10^7$  years.

The observed major features of the gas are compared in a  $l$ - $V$ -map (for  $b=0^\circ$ ) with predicted lines of constant distance from the centre and of constant galactocentric azimuth, for a velocity field with both rotation and expansion (Figure 1). No feature is found at forbidden velocities.

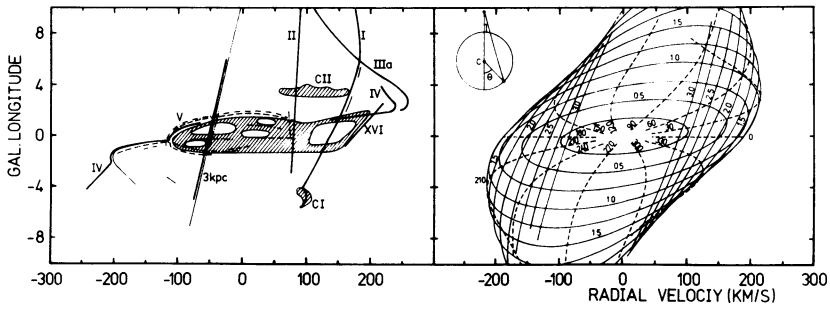


Figure 1: Comparison of the kinematics of observed features close to the galactic centre with a kinematical model containing both rotation and expansion. The observed features are

- HI data after Cohen and Davies 1976, MN 175, 1.
- Cohen and Few 1976, MN 176, 495.
- CO Bania 1977, Ap. J 216, 381.
- H<sub>2</sub>CO Scoville et al. 1974, Ap. J 187, L63