

DUST DISTRIBUTION NEAR YOUNG STARS OF BIPOLAR FLOWS DEDUCED FROM CCD POLARIMETRY AT  $1 \mu\text{m}$

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ABSTRACT. Deep direct  $1 \mu\text{m}$  images and polarization maps have been taken for several objects of bipolar molecular outflow, using a CCD camera at the prime-focus of the 3.5 m telescope on Calar Alto/Spain. Compact reflection nebulae are found near GL2591, GL2884 = S140/IRS1, GL2789 = V645 Cyg, L1551/IRS5 and within the red reflection nebula in Serp. The position angles of polarization vectors coincide in all cases with that of the  $2.2 \mu\text{m}$  polarization of the central source itself, and it is perpendicular to the direction of mass outflow (if it is well defined). The visual extinction in front of the central source, is at least 20 mag higher than that which is affecting the scattered light. This is consistent with a model of bipolar outflow, where the active source is surrounded by a dust torus or ring.

As an example, the results for GL2591 are given in Fig 1 and 2.

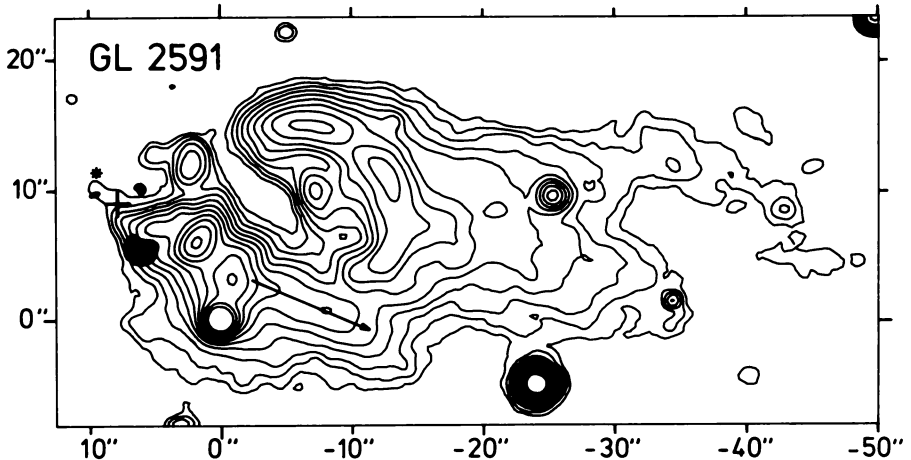


Fig. 1 GL2591

Isophotal contour map (logarithmic scaling by a factor of  $\sqrt{2}$ ).  
Coordinates are given relative to the star at the position:  
 $20^{\text{h}}27^{\text{m}}35^{\text{s}}.13$ ,  $40^{\circ}01'05''0$  (1950)

- + Position of infrared source (Lada et al. 1984)
  - 5 GHz - VLA HII-region (Campbell 1985)
  - \* Position of the H<sub>2</sub>O-maser source (White et al. 1975)
- A jet-like feature is marked by an arrow, which gives at the same time the direction of the blue CO wing (Lada et al. 1984)

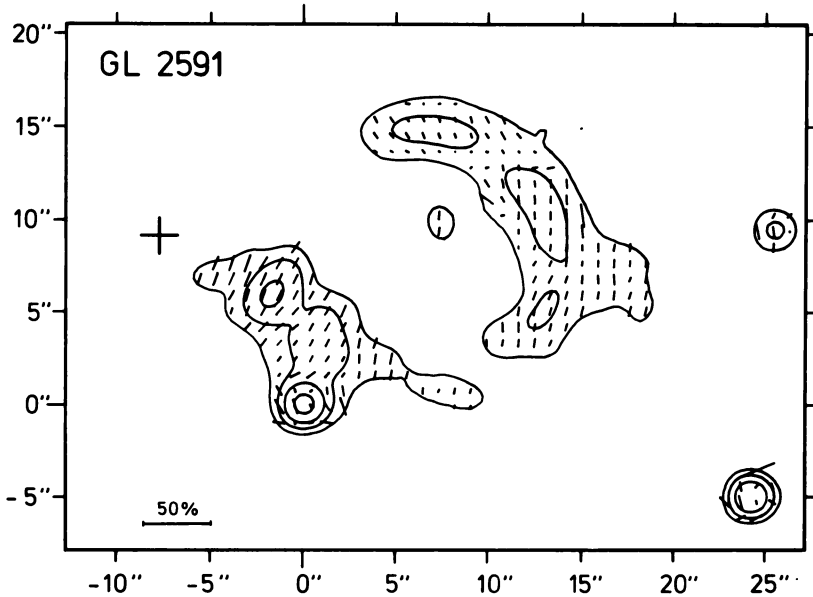


Fig. 2  
 The corresponding polarization map (electrical vectors).  
 + Position of infrared source

### References

- Campbell B., 1984, *Ap.J.* 287, 334  
 Lada, Ch.J., Thronson, H.A., Jr., Smith, H.A., Schwartz, P.R., Glaccum, W., 1984, *Ap.J.* 286, 302  
 White, G.J., Little, L.T., Parker, E.A., Nicholson, P.S., McDonald, G.H., Bale, F., 1975, *MNRAS*, 170, 37p