

KINEMATICS OF ABELL 30

George H. Jacoby
Kitt Peak National Observatory

You-Hua Chu
Astronomy Department, University of Illinois

Abell 30 is a remarkable PN with a H-depleted core. Four bright knots have been identified in the [O III] line (Jacoby 1979). The previous kinematic study has shown that J1 and J3 form a pair expanding at radial velocities of ± 25 km/s with respect to the central star, and J4 has a radial velocity of -22 km/s (Reay, Atherton, and Taylor 1983).

We have obtained deep-exposure echelle spectra of the knots in the core of A30. The results, while confirming the radial velocities of J1 and J3, show previously-undetected multiple components in J2 and J4.

The average heliocentric velocity of A30 is +10 km/s. The knot J1 is dominated by one single component at +34 km/s, while J3 is dominated by a single component at -13 km/s. The knot J2 is kinematically resolved into at least four components at velocities of -13, +31, +60, and +87 km/s, with the +31 km/s component being the brightest. The knot J4 is resolved into four components at $\geq +66$, +36, -10, and -50 km/s; the brightest component at -10 km/s appears tilted with -2 km/s at the inner edge and -17 km/s at the outer edge.

The components in J2 and J4 form arc-like patterns in the echellograms. Such pattern can be explained by a clumpy expanding ring structure. The position angle of the ring is similar to that of the infrared disk detected by Dinerstein and Lester (1984).