NEW OVRO RESULTS SHOW DISKS ARE NOT NECESSARY FOR FOCUSSING BIPOLAR OUTFLOWS

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In order to better understand the outflow phenomenon in young, high mass stars, the three sources S87, LkH$_\alpha$101, and S106 were chosen for closer study. High spatial resolution (5″ millimeter line ^{13}CO (J=1→0) and CS (J=2→1) maps of these sources were obtained with the Owens Valley Radio Observatory's (OVRO) millimeter array at 0.15 and 3.0 km s^{-1} resolutions, respectively.

The OVRO (Owens Valley Radio Observatory) maps were combined with data from the 14 m FCRAO (Five College Radio Astronomy Observatory) millimeter wave radio telescope, the VLA, IRAS, and the Palomar 5 m and 1.5 m telescopes. A synthesis of the data reveals that although all three pre-main sequence objects are the sources of powerful, ionized, stellar winds, only one, S87/IRS1, LkH$_\alpha$101, and S106 IR are $1.8 \times 10^{-5}, 1.7 \times 10^{-6}, and 1.1 \times 10^{-5}\ M_\odot yr^{-1}$, with corresponding wind velocities of 160, 350, and 220 km/s. In all cases, the wind velocities are lower, and the mass loss rates higher, than for main sequence stars of the same spectral types. Radiation pressure in inadequate to drive these winds, which can be anisotropic in their velocity fields.

The existence of massive, large scale (r≈ 10^{16} cm) disks, required by numerous proposed molecular outflow models, can now be ruled out. This conclusion is based on the results of high (5″) spatial resolutions millimeter line observations of S106. This source, which has heretofore been the best disk candidate in the context of high-mass star formation, turns out not to have a large, molecular gas disk. Instead, the kinematic and spatial structure of the molecular material in S106 is indicative of swept-up, turbulent, remnant cloud gas. Only one of the many proposed *molecular outflow models is consistent with the new observations* (Königl, 1982).

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