The 3D Morphology of VY Canis Majoris: Kinematics, Polarimetry, and the Line-of-Sight Distribution of the Ejecta

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SiO J = 1 - 0

Shinnaga et al.
2003

658nm HST image
The Data Set

High resolution imaging with HST/WFPC2 in 2 epochs
High resolution spectroscopy (Keck)
Polarimetry with HST/ACS/HRC

Radial Velocities + Proper Motion = Total Motion

Polarimetry = Independent Placement in 3D
Proper motions of selected clumps, arcs and features in the reflection nebulosity surrounding VY CMa
Total Intensity  Photometric Color  Fractional Polarization

Note: Most features in the intensity map are also distinctive in the fractional polarization map = distinct features
Conclusions

• The arcs and knots appear to be separate geometric objects.

• They do not display any clear association with a simple bipolar outflow geometry.

• There is good agreement between the 3D geometry derived from two independent techniques.

• Some sort of magnetic phenomena near the star?