THE Hα EMISSION OF THE PMS STAR SERPENS/SVS 2

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Serpens is a region of low mass star formation where the magnetic field seems to play a fundamental role. The major axis of the Serpens outflows are aligned with the magnetic field. The most outstanding object in the region is the Serpens Reflection Nebula, SRN. This is characterized by a rather complex bipolar structure with several knots of gas and dust embedded in both nebular lobes. The western lobe is directed out of the cloud toward the observer. The SRN is illuminated by the PMS star Serpens/ SVS 2. The star is surrounded by a dust disk; the polarization pattern of the disk can be interpreted as produced by dust grains aligned by the magnetic field frozen-in with the disk.

A long-slit high resolution spectrum of the SRN has been obtained with the Cassegrain spectrograph of the 3.5 m telescope at the Calar Alto Observatory (Almeria, Spain). An RCA CCD detector, 30 μm pixel size, was used. The spectrum is centered in Serpens/SVS 2 and orientated in the East-West direction. The spectral resolution is 0.51 Å (≈23 Km/s at Hα) and the spatial scale is 0."57 pix^{-1}. The spectrum covers a spectral range from 6400 to 6900 Å and the exposure time is 3600 sec. Only a faint continuum and the Hα emission line have been detected; neither [S II], nor [N II] emission has been detected.

The Hα emission shows a rather complex structure which extends 7."5 (≈1900 u.a.) around the position of Serpens/SVS 2. The line is splitted in a blueshifted and a redshifted component. The blueshifted component extends from SVS 2 toward a condensation placed 3" (750 u.a.) to the west. The velocity is constant, ≈-180 Km/s, and the maximum intensity is observed in SVS 2. The redshifted component peaks 1."2 (300 u.a.) west of SVS 2 at a velocity of ≈110 Km/s. There seems to be a velocity gradient; the velocity increases to the west reaching around 230 Km/s, 3" west of SVS 2. It is quite unlikely that this complex structure is produced by a sole bipolar outflow; note that the blueshifted and the redshifted component form in the same region, but their maxima are located at different positions and their velocity gradients are completely different. Magnetic phenomena could play an important role.

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