Alfvén surface R_A, the toroidal field begins to dominate and it decreases less quickly, i.e. $b\phi \propto r^{-1}$.

Hα AND [S II] DIRECT IMAGES OF HERBIG-HARO OBJECTS 1 AND 2 WITH THE MEPSICRON DETECTOR

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Using the Mepsicron detection system, we obtained images of the region around Herbig-Haro objects 1 and 2. These images were taken with interference filters centred on Hα, on the red continuum (6648 A) and on the [S II] line at 6731 A.

We found two conical nebulosities connecting the central radio continuum source to HH1 and HH2. The emission lines (Hα and [S II]) are produced *in situ*, probably being excited by a shock wave created by the stellar wind emerging from the central source. Continuum emission is probably produced by reflected light from the same source. Some 10 arcsec to the NE of the central source we detected a small nebulosity with strong sulphur emission. Similarly, two emission knots were found ∿ 20 arcsec W of this source.

The sulphur to hydrogen ratio indicates that this nebulosity, as well as the two knots, are collisionally ionized. We did not detect optical emission from the central radio continuum source. This implies a limiting visual magnitude of 21.5 for the object.

THE STRUCTURE OF THE HH39 REGION

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HH39 is the group of Herbig-Haro (HH) objects associated with the young semi-stellar object R Monocerotis (R Mon) and the variable reflection nebula NGC 2261. An R CCD frame and a B prime focus plate of the region show a filament connecting NGC 2261 with HH39, confirming the association between R Mon and the HH objects. This filament is probably composed of emission material. The southern knot in HH39 has brightened

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over the last 20 years; its proper motion has been determined and is similar to that of the other knots. A total of 8 knots can be distinguished in HH39 surrounded by diffuse nebulosity. High resolution spectroscopy of the Hα and [N II] emission lines shows the spatial variation of the radial velocity structure over the largest knots (HH39 A and C). Distinct differences in excitation and velocity structure between the knots are apparent. The observations are compatible with the knots being high velocity ejecta from R Mon, decelerated by interaction with ambient material and with bow shocks on their front surfaces.

NEW HERBIG-HARO OBJECTS FOUND BY A NEW METHOD

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1. INTRODUCTION

So far discoveries of Herbig-Haro objects were done mainly by either of two different methods. The first relies on their non-stellar appearances on direct photographs, followed by low-dispersion slit spectroscopy; this is the most standard method. But sometimes only the former step is made; then picked-up objects are possible HH objects (e.g. Gyul'budagyan 1982, and Reipurth 1985). The second is based on objective-prism observations in the red with Schmidt telescopes. We have invented a third method to find new HH objects. This utilizes Schmidt telescopes, too, but can reach a fainter limiting-magnitude than that obtained with objective-prism observations.

2. OBSERVING TECHNIQUE

The observing technique consists in taking double exposures on a 103aF emulsion alternately through RG 645 and RG 610 filters with a small displacement. The band by the former filter is half as wide as that by the latter, hence twice longer exposure is applied to it. Then most celestial objects, including reflection nebulae and normal galaxies, produce two images of equal brightness side by side, whereas in HH objects the image through RG 645 is brighter than that through RG 610 by a factor of about 1.7 on the average due to their prominent emission-lines concentrated on the former band.

3. RESULTS AND SOME FOLLOW-UP OBSERVATIONS

The 105/150-cm Kiso Schmidt has been used to apply this method. We have