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SPECTROSCOPY OF HM SAGITTAE, A POSSIBLE EMBRYONIC PLANETARY NEBULA

The sudden six magnitude outburst of the emission-line object now known as HM Sagittae was reported by Dokuchaeva (1976). Subsequent spectroscopic observations by Stover and Sivertsen (1977) showed HM Sge to have strong emission lines of H, He I, He II, [OI], [OIII], and [AIII]; in general the spectrum resembled that of a planetary nebula. Feldman (1977) has reported a radio detection of this object at 10.5 GHz. In the infrared, the color temperature is 950 K, and moderate silicate emission is seen (Merrill 1977).

On 22 June 1977 UT we obtained three image-tube spectrograms of HM Sge at Ritter Observatory. The 1-m reflector and Cassegrain spectrograph were used with a Varo 8605 image-tube, yielding a dispersion 40 Å mm^{-1} over the wavelength interval λλ5800-7500. The spectra were recorded on hydrogen-treated 127-04 emulsion, and the resolution was ~1 Å. At the time of exposure the estimated brightness of HM Sge was V~11.

The table below lists the observed emission features and a visual estimate of their intesities.

λ_{Obs}	Identification		Intensity
5876.7	He I	5875.8	20
6300.7	[OI]	6300.2	5
6312.5	[SIII]	6312.1	7
6548.4	[NII]	6548.1	7
6563.3	Hα	6562.8	300
6583.6	[NII]	6583.6	15
6678.1	He I	6678.1	10
7065.2	He I	7065.2	25

Table (cont.)

λ_{Obs}	Identification		Intensity
7134.0	[AIII]	7135.8	20
7279.0	He I	7281.3	2
7316.9	[OII]	7319.0	25
7327.1	[OII]	7330.3	20

The measured radial velocity from half a dozen lines is $+25\pm3$ km s^{-1}. Because of distortions in the image-tube, the wavelengths longward of λ7100 have low accuracy and were not included in the velocity determination. To record the faint emission lines, two of the spectrograms have Hα heavily exposed. The third exposure was widened with optimal exposure of the Hα emission. On this latter spectrogram, no evidence for structure or profile asymmetry in Hα is seen. The continuum is surprisingly strong on our plates; an apparent weakening of the continuum near λ6200 may be due to TiO, but further spectrograms will be required to confirm this.

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