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SPECTROPHOTOMETRIC MAPPING OF THE PLANETARY NEBULA NGC 6369

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In this work we present the results of mapping the planetary nebula NGC 6369 with long-slit spectroscopy. The observations were carried out with the CTIO 1.5 m telescope and Cassegrain spectrograph. Ten slit positions were observed across the nebula with a total exposure time of 11 hours. All positions were then combined to create "images" in emission lines like [O III] 5007, Hα, [N II] 6584 and others. These images can then be used to study the classical diagnostic line ratios such as the [S II] doublet, which is a density indicator. The [S II] ratio maps, as well as the Hα/Hβ extinction maps for this object and total line fluxes for the most important lines are presented.

TABLE 1

LINE FLUXES[a]

Line	Flux	Corr. Flux	3σ (%)
Hα	13.795	2.962	2.29
[N II] 6584	3.689	0.739	4.93
[N II] 5755	0.038	0.014	45.47
[O III] 5007	14.562	12.369	2.24
He II 4686	0.013	0.015	53.91
He I 6678	0.219	0.044	18.44
[O I] 6300	0.220	0.053	19.06
[S II] 6717	0.245	0.043	21.04
[S II] 6731	0.370	0.067	16.12
[S III] 6311	0.054	0.014	33.39

[a]H$\beta = 1$ with corrected $\log(\mathrm{H}\beta) = -9.153\,\mathrm{erg\,s^{-1}\,cm^{-2}}$.

The final transition images were obtained from the spatially integrated flux profile in each slit. The profiles for each slit position were then combined and interpolated using a cubic convolution algorithm to reconstruct an image of the nebula for that transition. Integration of this final image provides the total observed flux for the nebula. Note that this procedure gives a better determination of the total flux and relative line intensities since it takes into account the nebula as a whole and not just one slit position.

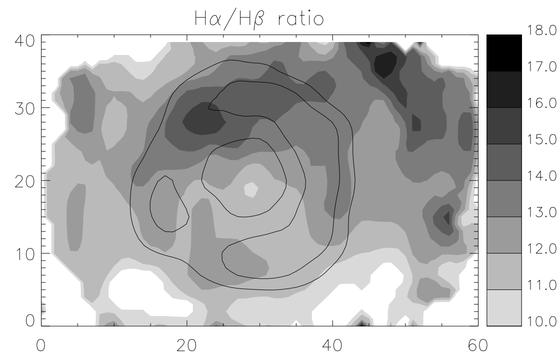

Fig. 1. Extinction map obtained from the Hα/Hβ observations.

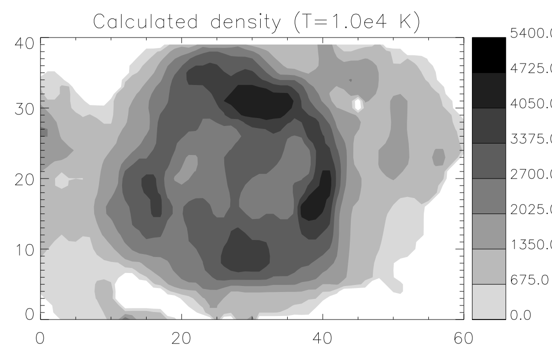

Fig. 2. Density map obtained from the observed [SII] ratios.

The reconstructed images for each line were corrected for reddening using the Hα/Hβ ratio map (see Figures 1 and 2). The logarithmic correction constant was calculated pixel by pixel using the theoretical value of Hα/H$\beta = 2.95$ (obtained from photoionization models) and the reddening curve of Seaton (1979).

The final calculated fluxes, reddening corrected fluxes, relative to Hβ, and their respective 3σ errors for the most important lines are shown in Table 1.

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