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to build maps of many interesting line intensity ratios. The maps of electron density and temperature were obtained using the [S II] λ6717/λ6731 and [O III] (λ5007+λ4959)/λ4363 line ratio sensors, respectively. N49 presents a strong density gradient with the density varying from 600 cm^{-3} at the North-West to more than 3000 cm^{-3} at the South-East. The electron temperature distribution shows a rough spherical symmetry with the higher values found at the centre. In N11L the electron density varies from less than 100 cm^{-3} to about 400 cm^{-3}, with the higher values found on the bright filaments. These maps were used to build a picture of the structure of these two supernova remnants.

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DENSITIES, TEMPERATURES, PRESSURES, AND ABUNDANCES DERIVED FROM O II RECOMBINATION LINES IN H II REGIONS AND THEIR IMPLICATIONS

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Based on high-quality observations of multiplet V1 of O II and the NLTE atomic computations of O II, we study the density and temperature of a sample of H II regions. We find that the signature for oxygen-rich clumps of high density and low temperature is absent in all objects of our sample: one extragalactic and eight Galactic H II regions. The temperatures derived from (1) recombination lines (RLs) of O II, and (2) RLs of H I together with Balmer continua are lower than those derived from forbidden lines, while the densities derived from RLs of O II are similar or smaller than densities derived from forbidden lines. Electron pressures derived from collisionally excited lines are about two times larger than those derived from RLs. These results imply that the proper abundances are those derived from RLs and suggest that other processes in addition to direct photoionization, such as dissipation of turbulent energy in shocks, magnetic reconnection, and shadowed regions, might be responsible for the large abundance discrepancy factor and t^2 values observed in H II regions.

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SPATIAL VARIATIONS OF PHYSICAL AND CHEMICAL PROPERTIES OF THE PLANETARY NEBULAE NGC 6302 AND NGC 2440

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We present an analysis of the physical and chemical conditions of the planetary nebulae NGC 6302 and NGC 2440 through spatially resolved spectroscopy. Long slit spectrophotometric data were obtained with the Goodman spectrograph attached to the 4.1 m SOAR telescope in several different declinations with the slit on the East-West direction. From them, maps and spatial profiles were constructed. Electron densities were calculated from the [S II] and [Ar IV] sensors, and electron temperatures from the [N II] and [O III] sensors. Small temperature fluctuations on the plane of the sky were obtained. Abundances of N^+, O^+, S^+, S^2+, O^{2+}, Ne^{2+}, Ar^{3+}, Ar^{4+} relative to H^+ were determined from collisionally excited lines, and relative abundances of He^+ and He^{2+} from recombination lines.

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THE MAGNETIC FIELD STRUCTURE OF MUSCA DARK CLOUD

N. L. Ribeiro[1], A. M. Magalhães[1], A. Pereyra[2], and L. Cambresy[3]

Our goal is the study of the magnetic field (MF) structure of a pre-collapse structure of the interstellar medium - the Musca Dark Cloud (MDC), a nearby (200-250 pc), large (0.25° x 3°) filamentary cloud. A description of the MF, together with knowledge on turbulence and gravitational forces, is key to understanding the evolution of interstellar clouds.

We have obtained linear polarization measurements in the H band (1.65μm) with the Brazilian's 60 cm and 160 cm telescopes located at the OPD observatory. By combining these with our earlier optical observations (Pereyra & Magalhaes 2004), we were able to probe regions denser than what was possible in the optical.