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IDENTIFICATION ATLASES OF MOLECULAR SPECTRA

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In astrophysics, as in all research fields in which molecular spectra play important roles, there has been a continuing need for compendia of information on individual band systems. Firstly there is a requirement by observers and experimenters for aids to definitive identification of observed spectral features. Secondly there are needs by observers, by those who make diagnostic interpretations of spectral profiles, and also by theorists, for definitive critical compilations of appropriate molecular data with reference to the relevant literature. The continued popularity of various editions to Pearse and Gaydon's Identification of Molecular Spectra (1) and to Huber and Herzberg's Constants of Diatomic Molecules (2) are clear evidence of this.

In recognition of the need to augment the information in Pearse and Gaydon's compilation, the author and his colleagues established in the decade starting with 1964 an Identification Atlas of Molecular (3) series. Each of these roughly 20 page documents were devoted to one (diatomic) band system. It included a general description of the band system, its appearance and occurrence, an historical survey, tables of critically compiled molecular data, and plates of vibrationally identified spectra at low, medium and high resolution. These atlases were professionally printed, and because of cost the print runs were not large.

The more than a decade hiatus in Phase 1 of this project due to lack of funds (granting agencies do not look on such scholarly compilations as research !) has recently ended and Phase 2 has been initiated. This is a direct result of the formation of the Province of Ontario Centre of Excellence, The Institute for Space and Terrestrial Science and its support.

Phase 2 atlases have the same *raison d'être* as those of phase 1. However the spectra will be presented as intensity plots rather than as photographic plates. The plots will be numerically derived using our extensive realistic spectral synthesis facility (4). The atlases will be published "in house" inexpensively using desktop published facilities. The early atlases in the Phase 2 series will be devoted to atmospheric and astrophysical band systems.

REFERENCES

- Pearse, R.W.B. and Gaydon, A.G. (1976). Identification of Molecular Spectra (Fourth Edition) (First Edn. 1941, Second Edn. 1950, Third Edn. 1963) Chapman and Hall London.
- Huber, K.P. and Herzberg, G. (1979). Constants of Diatomic Molecules. Van Nostrand-Reinhold New York.
- Nicholls, R.W. et al. (1964-1972). Identification Atlases of Molecular Spectra
1: AlO (A-X); 2: N₂(C-B); 3: N₂⁺ (B-X)
4: O₂ (B-X); 5: C₂(A-X'); 6: O₂ (A-X)
7: VO (C-X); 8: CN (A-X), CN (B-X)
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- Nicholls, R.W. and Cann, M.W.P. (1985). Realistic Numerical Synthesis of Molecular Spectra Trans IAU XIXB 146-152 1985.