Mem. S.A.It. Vol. 74, 218

Memorie della

Numerical studies of laboratory spectra

M. Missana

Osservatorio astronomico di Brera, via Brera 28, 20121 Milano, Italy
e-mail: missana@brera.mi.astro.it

Abstract. Laboratory FeI spectral lines have been observed with the Fourier Transform Spectrograph of the McMatt Observatory in Arizona, used for measurement in the infrared region. These spectra are studied numerically.

Key words. instrumentation: spectrographs – methods: numerical

1. Introduction

The measurements of 327 selected FeI spectral lines in the region between 3600-5775 Å, have been obtained from 5 spectra emission measured with the Fourier Transform Spectrograph (FTS) of the McMatt Observatory (Arizona), in November 1991. The FTS is used for precise determinations in the infrared bands (Litzén & Vergés 1976), because it can give in a few days, all the spectra that a classical grating spectrograph gives in one year of observations. The spectra have been studied with the program *TUCFE.f* written in Fortran77, giving for the lines of the assigned file, determinations of wavelength and related error, intensity, full half width at 2/3 of the intensity and asymmetry.

2. Program and Results

These results are obtained calculating the spectrum from its Fourier transform and after, for each wave number of the assigned file, finding the nearest and the more intense spectral line in the observed spectrum. Then the top of this observed line is fitted with a polynomial of degree 3, by the least squares, and finally the spectral data are calculated. These spectral data are collected in a matrix with 327 lines and 7 columns. For each spectral line we have: the measured wavelength, the corresponding wavelength in air, the wavelength error, the intensity, the width measured at 2/3 of the intensity, the asymmetry, a laboratory wavenumber of the spectral line given in the assigned file.

The numerical results and a first discussion of the program, together with the source code, are given in the report Missana (2001). The results suggest that future improvement of this FTS could be very useful for near-IR observations.

References

Litzén, U., & Vergés, J. 1976, Phys. Scripta, 13, 240

Missana, M. 2001, *Riduzione di 5 spettri di laboratorio a mezzo del programma TUCFE.f*, Brera Obs. internal rep., 1-65