

PyParadise User Manual

B. Husemann^{1*}, O. Choudhury², J. Walcher²

¹*European Southern Observatory, Karl-Schwarzschild-Str. 2, 85748 Garching b. München, Germany*

²*Leibniz-Institut für Astrophysik Potsdam, An der Sternwarte 16, 14482 Potsdam, Germany*

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ABSTRACT

1 INTRODUCTION

Throughout the paper we assume a cosmological model with $H_0 = 70 \text{ km s}^{-1} \text{ Mpc}^{-1}$, $\Omega_m = 0.3$, and $\Omega_\Lambda = 0.7$.

2 QUICK START

3 STELLAR POPULATION MODELLING

3.1 Algorithm

3.2 Template handling

3.3 Masking

3.4 Configuration file

4 EMISSION-LINE MODELLING

4.1 Algorithm

4.2 Line profiles

4.3 Configuration file

5 BOOTSTRAP ERRORS

5.1 The importance of error estimation

6 DATA INPUT FORMATS

Like any software package PYPARADISE also requires that data is provided in certain pre-defined formats to run successfully. Failure of the program may often be related to invalid input. Therefore, users are strongly encourage to read this section carefully before using this software for their analysis.

6.1 Spectral data

PYPARADISE can be feed with three basic types of spectral data. These are 1) a single spectrum, 2) row-stacked spectra (hereafter RSS), and 3) 3D data cubes. The minimum information they all contain are the wavelength grid and the corresponding flux densities that makes up the spectrum. Optinal but often important information are the associated errors and known bad pixels. All three types have different technical specifications to store those data. They are automatically identified by PYPARADISE if the format is consistent with the specifications.

6.1.1 Single Spectrum

There are various possible format to store a single spectrum. To facilitate the usage of PyParadise we implement a few common formats, the SDSS-DR7-like fits image format, the SDSS-DR10-like table format, and an ascii table format. They are widely distributed in the community. Since PyParadise does not require all the informations that are stored in SDSS spectra, a user can easily create a conform spectrum that can be used with PyParadise only with the minimum content as described below.

6.1.2 RSS files

A RSS file is the primary output of a multi-fiber spectrograph, either a MOS or IFU system. It is a simple stack of spectra that share a **common** wavelength grid. PYPARADISE accepts RSS fits files as input. Here we adapt the format in which the CALIFA DR1 and DR2 RSS files are distributed. The specifications are given in the Table.

6.1.3 Data cubes

6.2 Template spectra

7 RUNNING PYPARADISE

8 OUTPUT FILES

8.1 Stellar population results

8.2 Emission-line results

9 GUIDELINES

9.1

9.2 Distuingish bad from good fit results

10 CONCLUSIONS

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FITS structure	name	data type	required	unit	description
Header					