

Make a config.yaml file for the example WASP14

Modification History:

>>> ZJ Zhang (Jul. 9th, 2017) zhoujian@hawaii.edu

START

1. Overview

“config.yaml” records all information necessary for the program to reduce and fit the data.

2. Details

The config.yaml file is adapted (almost copied) from Gully’s version <https://github.com/gully/starfish-demo/blob/master/demo1/config.yaml>

#####

YAML configuration script

name: ZJ_eg01_wasp14 => name of the example

data:

grid_name: “PHOENIX” => model library being used

files: ["data/WASP14/WASP14-2009-06-14.hdf5"] => input data: target’s spectrum in HDF5 format

instruments : ["TRES"] => instrument ID

orders: [21] => selected order for fitting

outdir : output/ => output directory (relative path)

plotdir : plots/ => plots directory (relative path)

The parameters defining your raw spectral library live here.

grid:

raw_path: "/Users/zhang-

dirac/Dropbox/Laniakea/ZhangDirac/OtherWorlds/Spec_Lib/Spec_for_Starfish/libraries/raw/PHOENIX/" => model library (absolute path)

hdf5_path: "libraries/PHOENIX_TRES_wasp14.hdf5" => output file of "grid.py --create"

parname: ["temp", "logg", "Z"] => name of fitting parameters

key_name: "t{0:.0f}g{1:.1f}z{2:.1f}" # Specifies how the params are stored => format of model library using parameter names (depends on models)

in the HDF5 file

parrange: [[6000, 6300], [4.0, 5.0], [-1.0, 0.0]] => parameter ranges

wl_range: [5000, 5200] => wavelength range

buffer: 50. # AA

PCA:

path : "PHOENIX_TRES_wasp14_PCA.hdf5" => output file of ""

threshold: 0.999 # Percentage of variance explained by components. => threshold value determining the number of eigenspectra

priors: [[2., 0.0075], [2., 0.75], [2., 0.75]] # len(parname) list of 2-element lists. Each 2-element list is [s, r] for the Gamma-function prior on emulator parameters

#Longer strings can be written like this. This will be loaded under the "Comments" variable.

Comments: >

WASP14 spectrum using emulator.

The parameters shared between all orders

Theta : => starting point of parameters (used for emcee)

```
grid : [6100., 4.19, -0.31]  => Teff, log g, Z (roughly obtained from Table 1 of Czekala+2015)
vz : -4.75122  => radial velocity of WASP14 (obtained from Gully's demo1)
vsini : 6.6935  => rotational velocity (obtained from Gully's demo1)
logOmega: -12.6949  => Omega (obtained from Gully's demo1)
Av: 0.0  => V-band extinction (obtained from Gully's demo1)
```

```
# Uncomment this line and set equal to the value of logg, if you'd like to fix it.
# fix_logg : 4.29
```

```
Theta_jump :  => steps of parameters (used for emcee)
  grid : [3, 0.003, 0.001]
  vz : 0.01
  vsini : 0.01
  logOmega: 1.e-4
  Av: 0.01
```

```
cheb_degree: 4
cheb_jump : 1.0e-4
```

```
Phi :
  sigAmp : 1.0
  logAmp : -13.6
  l : 20.
```

```
Phi_jump :
  sigAmp : 0.025
  logAmp : 0.01
  l : 0.25
```

```
region_params:
logAmp: -13.6
sigma: 7.
```

```
sigma_clip : 4. # how many sigma should we go in order to instantiate local kernels.
```

```
#####
```

3. Funeral

Now the “config.yaml” file is established, then we could digest the configure file and create model grids. See Note: [1. Test Example-WASP14: III. Create grids.](#)