

# Taipan-FluxCal:

## TAIPAN Flux Calibration Status



**MICHAEL COWLEY**

TAIPAN TEAM MEETING, AUGUST 31 2016



**MACQUARIE**  
University  
SYDNEY • AUSTRALIA



Australian Government  
Department of Industry and Science





# GOALS

1. Enable high accuracy flux calibration for TAIPAN
2. Provide simple flux calibration code that can be integrated into the **TLDR** pipeline

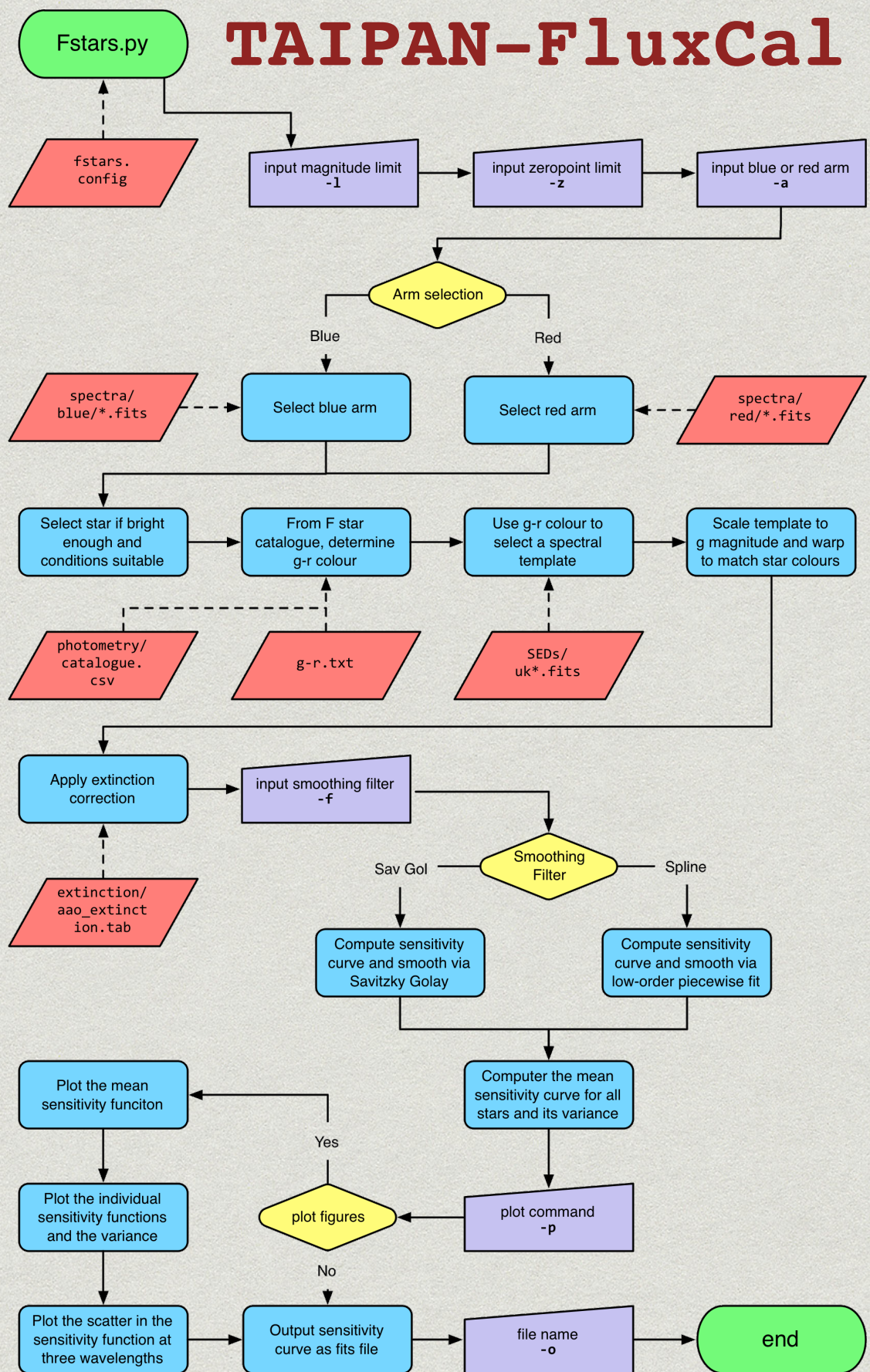


# GOALS

1. Enable high accuracy flux calibration for TAIPAN
2. Provide simple flux calibration code that can be integrated into the **TLDR** pipeline:

- ...
- ...
- sky-subtracted 1D spectra from TLDR
- **throughput vectors from TAIPAN-FluxCal**
- throughput vector and splicing applied by TLDR
- redshifting and everything else...
- ...
- ...



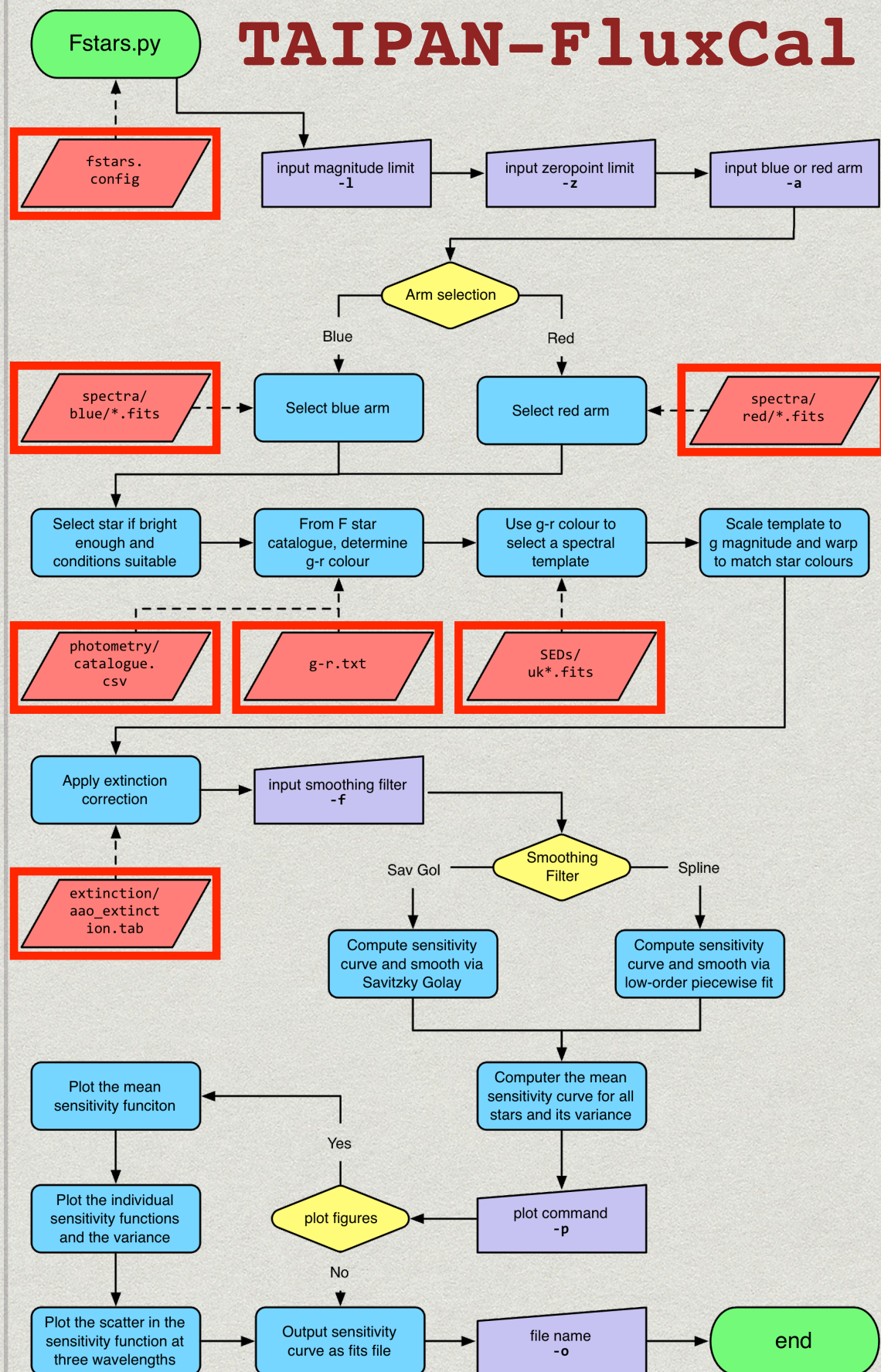


Thanks, Chris





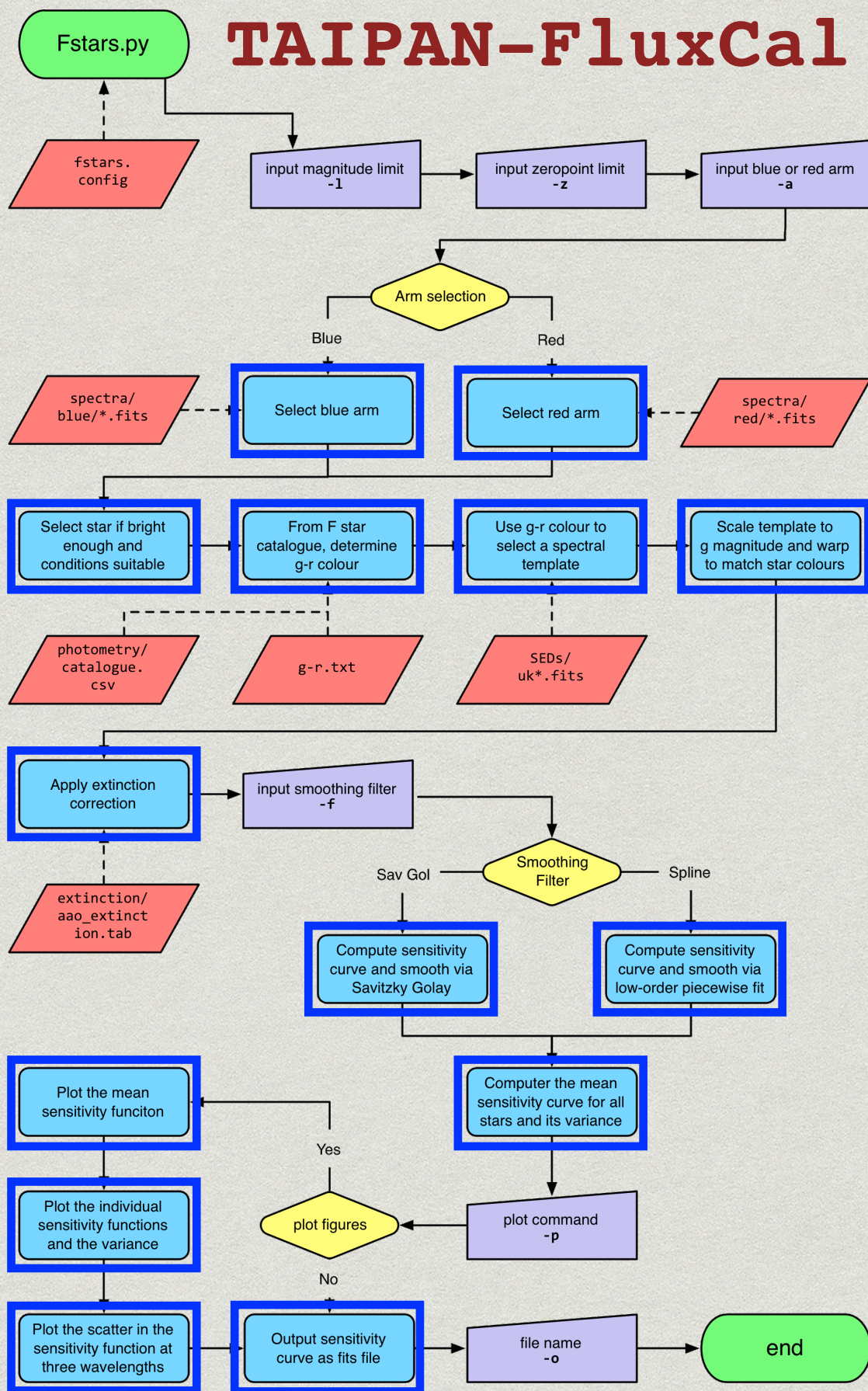
# TAIPAN-FluxCal



## Inputs

- F star photometry
- F star spectra
- Spectral templates (various F-type from Pickles+98)
- Colours of spectral templates (g-r)
- Atmospheric extinction at AAT
- Filter curves for TAIPAN

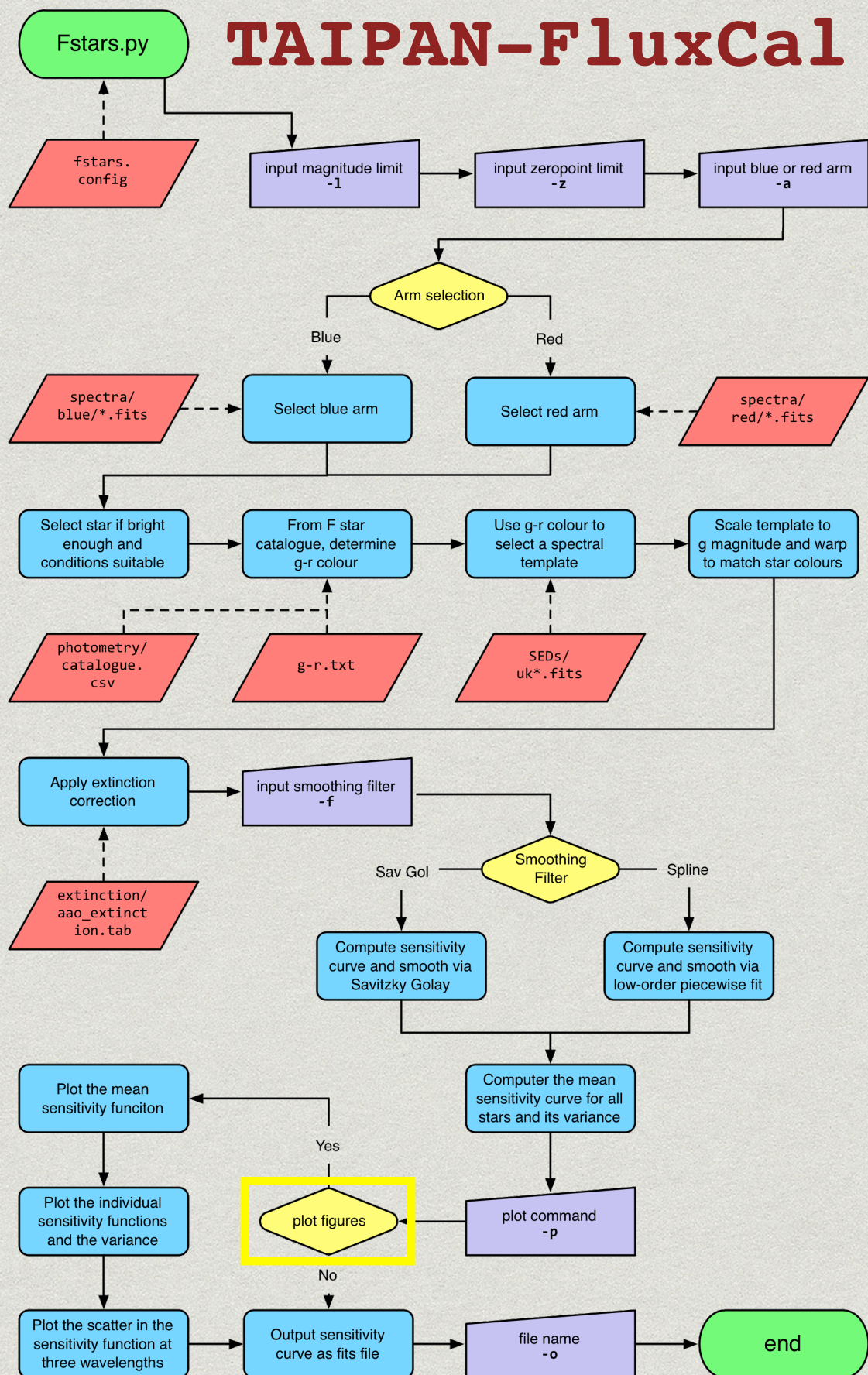




## Processes

- Select F stars within magnitude and zero-point thresholds
- Determine their g-r colours using the photometry catalogues
- Select their best match spectral template using g-r colours
- Warp the spectral template to match the broadband photometry
- Apply the extinction correction
- Compute the sensitivity curve (spectrum/warped template) and smooth it
- Compute and output the mean sensitivity curve

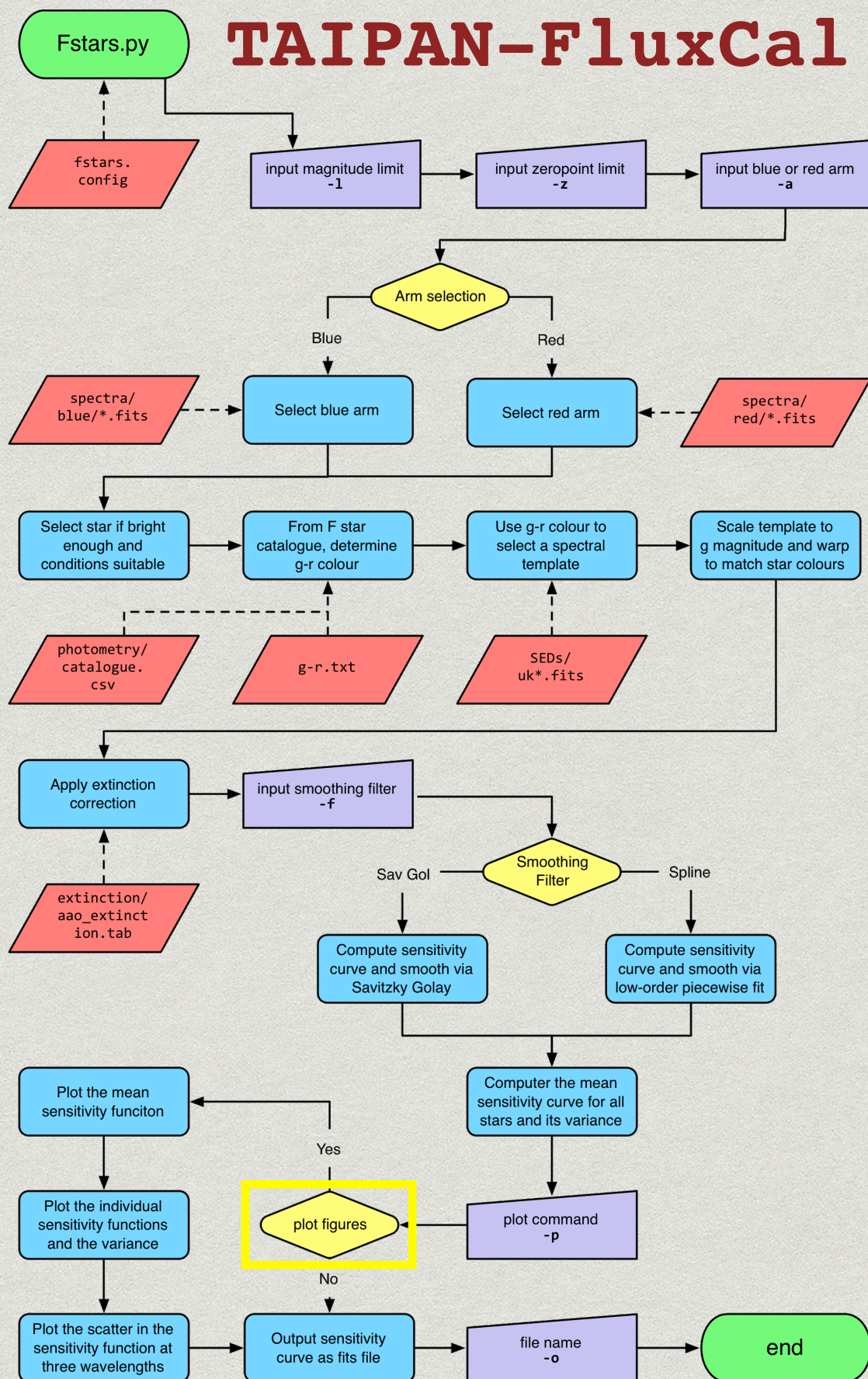




## Plots

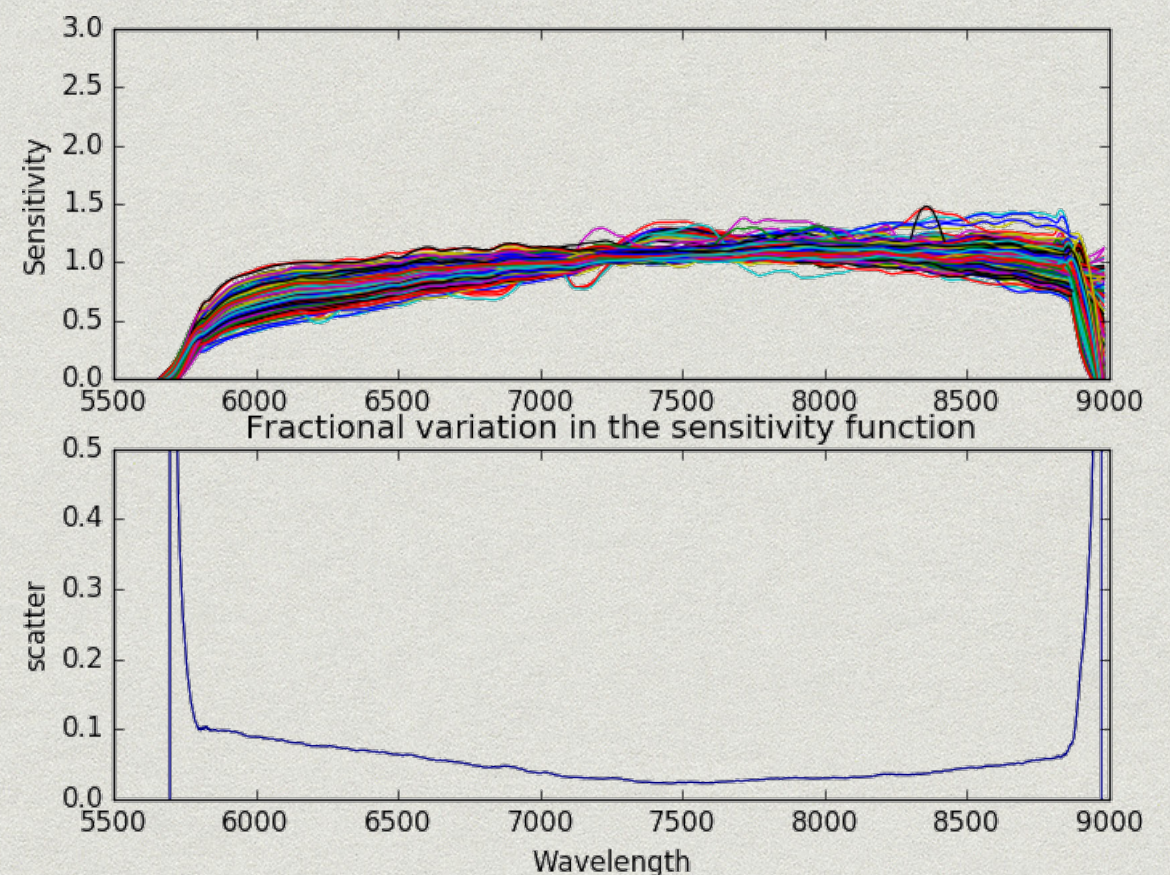
- The individual sensitivity functions and the variance
- The scatter in the sensitivity function at three wavelengths
- The mean sensitivity function



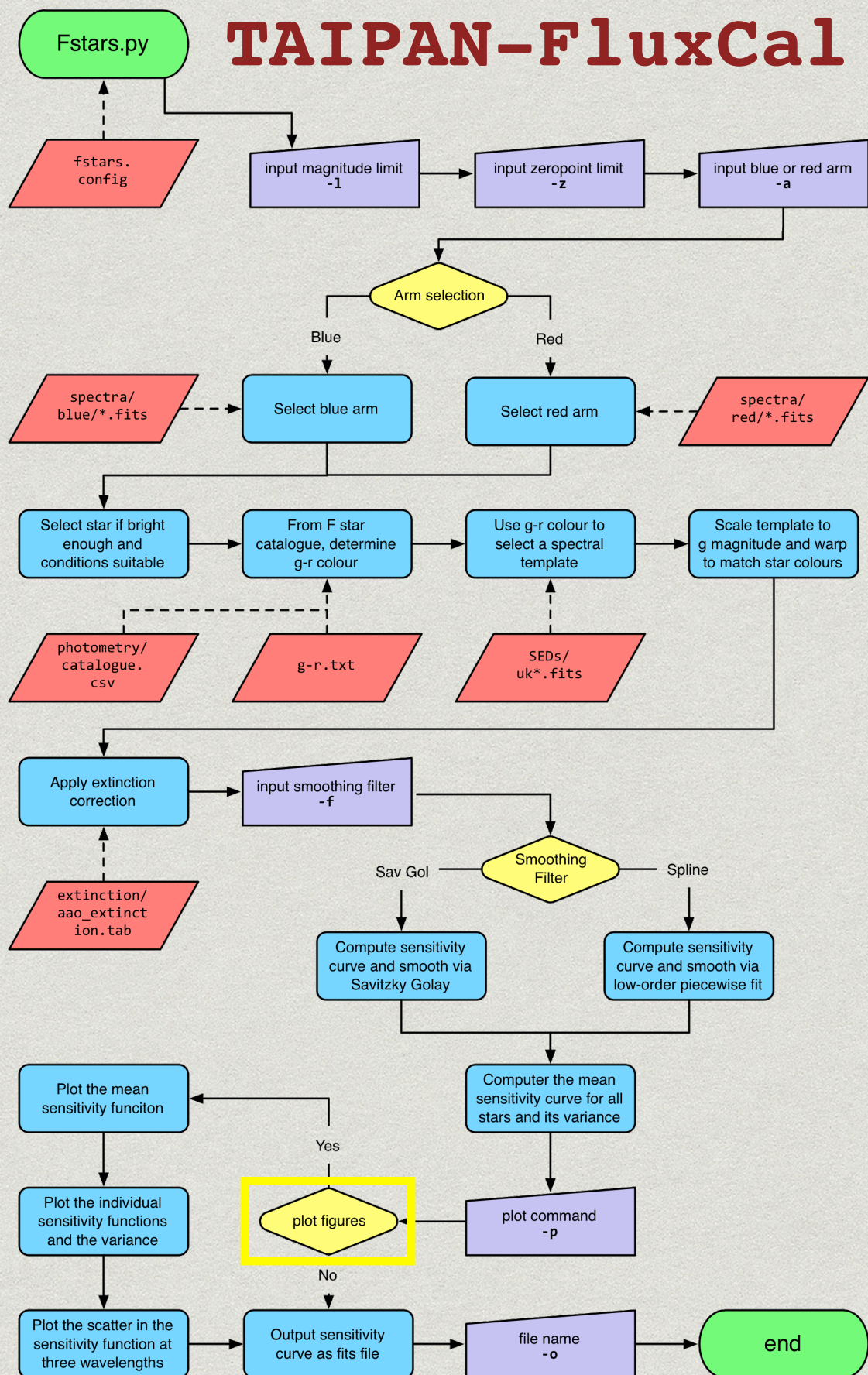


## Plots

- The individual sensitivity functions and the variance
- The scatter in the sensitivity function at three wavelengths
- The mean sensitivity function

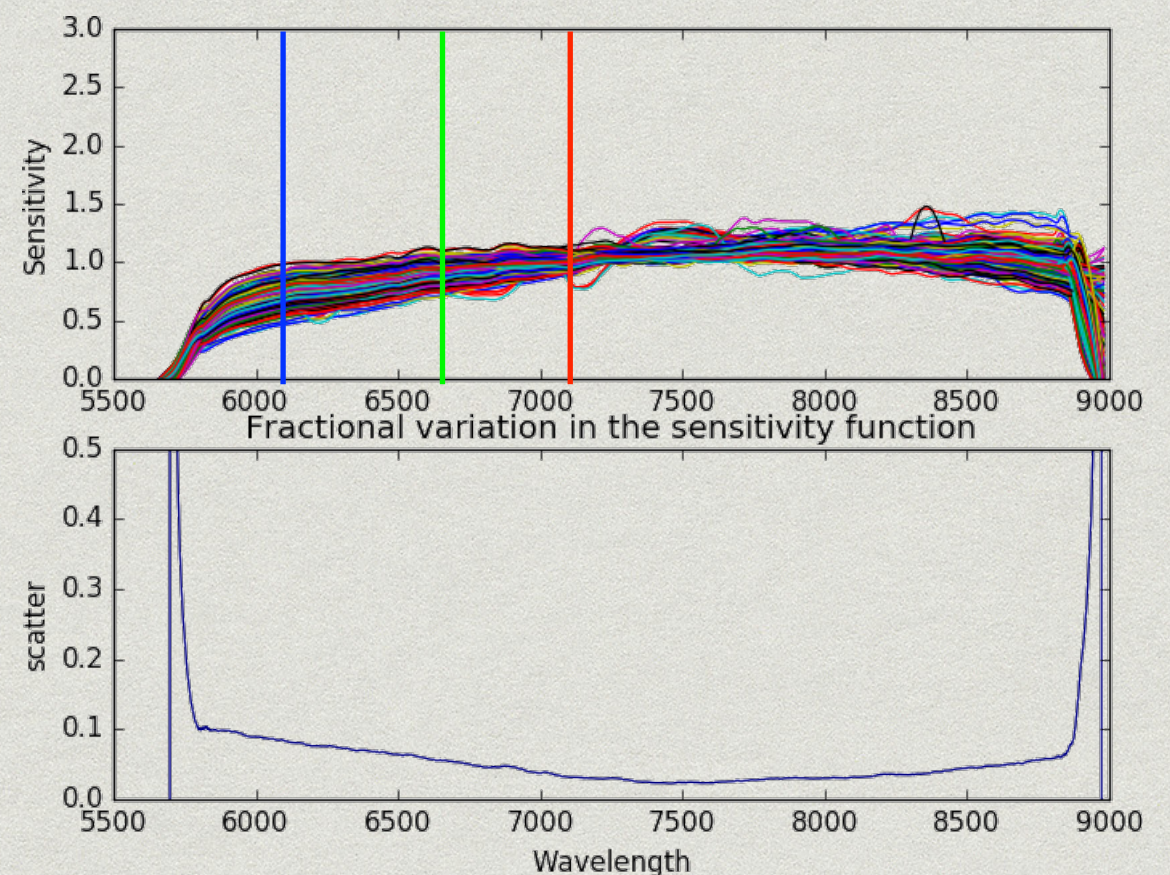




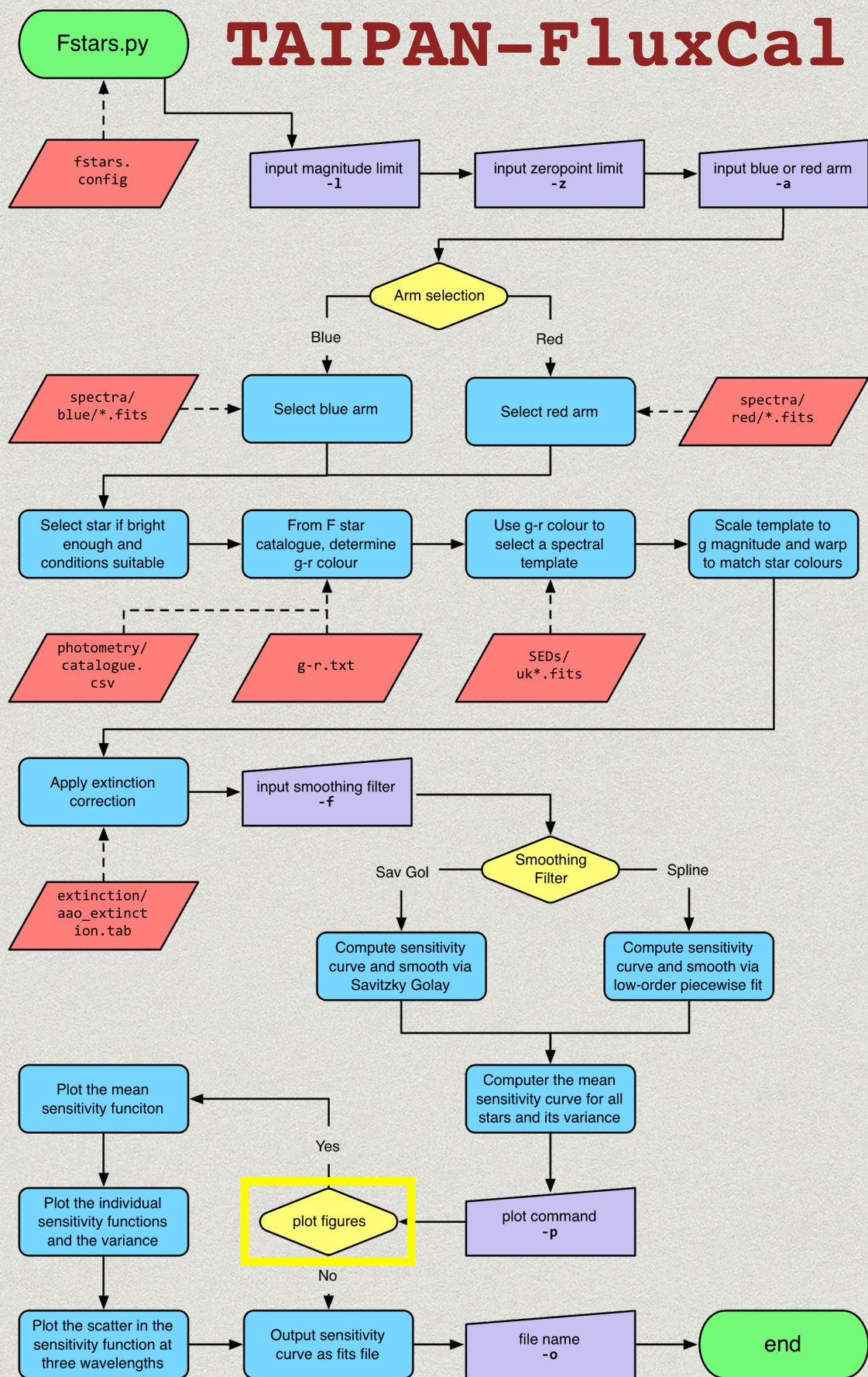


## Plots

- The individual sensitivity functions and the variance
- The scatter in the sensitivity function at three wavelengths
- The mean sensitivity function

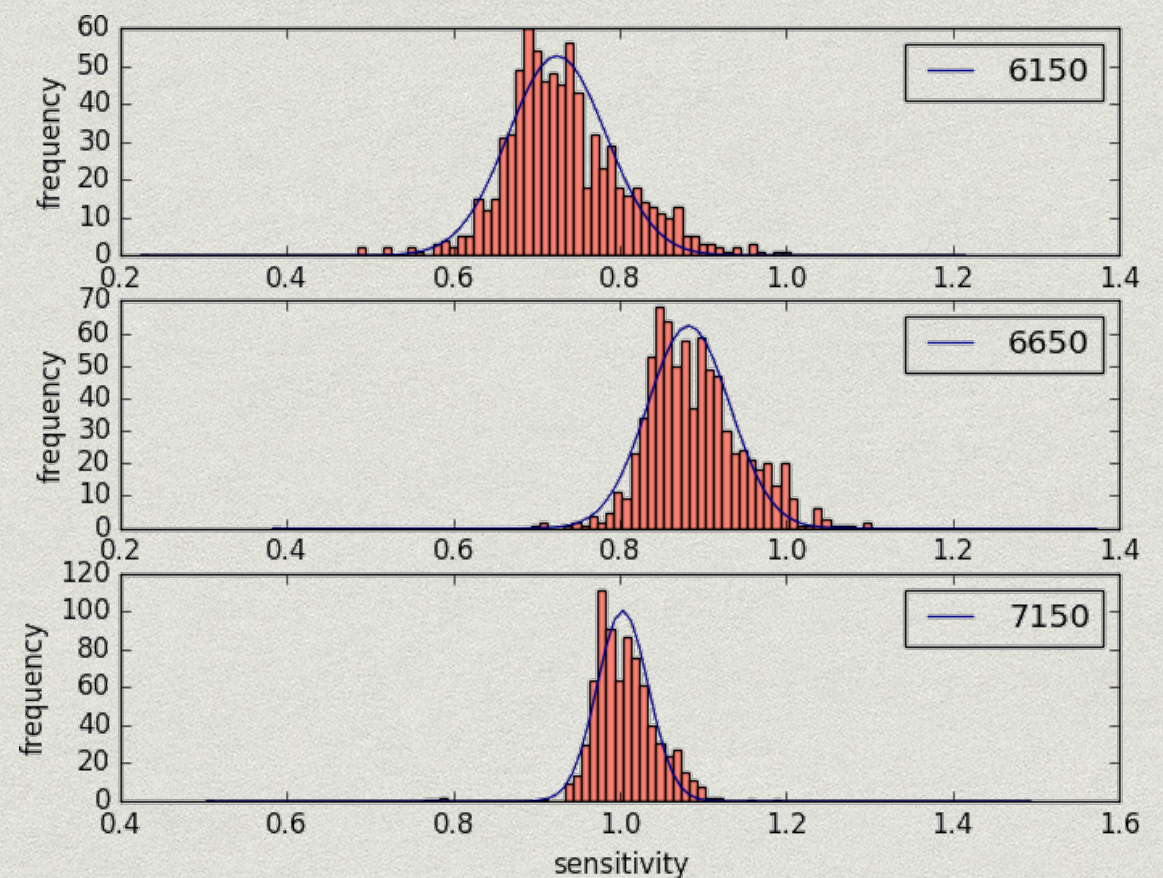




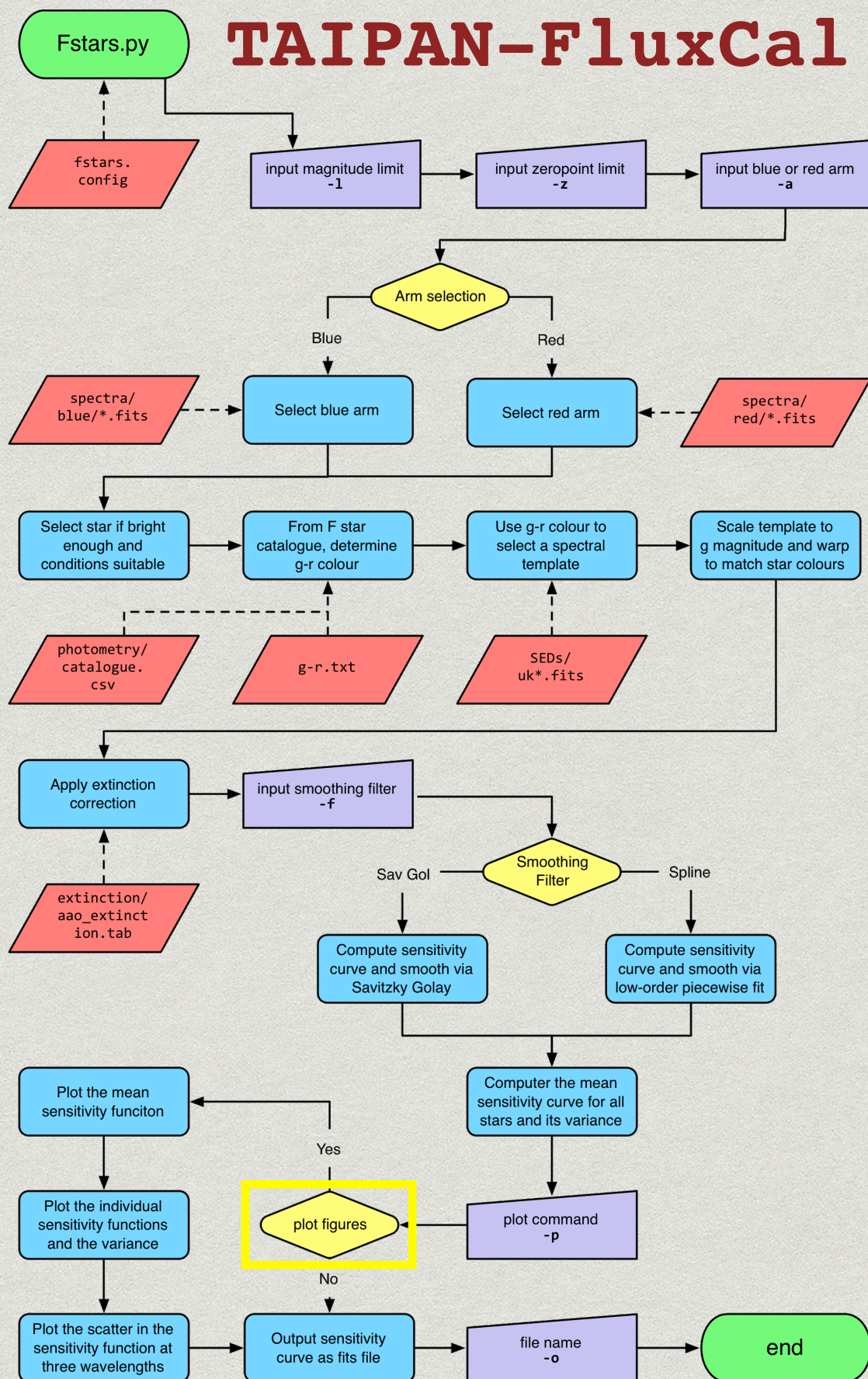


## Plots

- The individual sensitivity functions and the variance
- **The scatter in the sensitivity function at three wavelengths**
- The mean sensitivity function

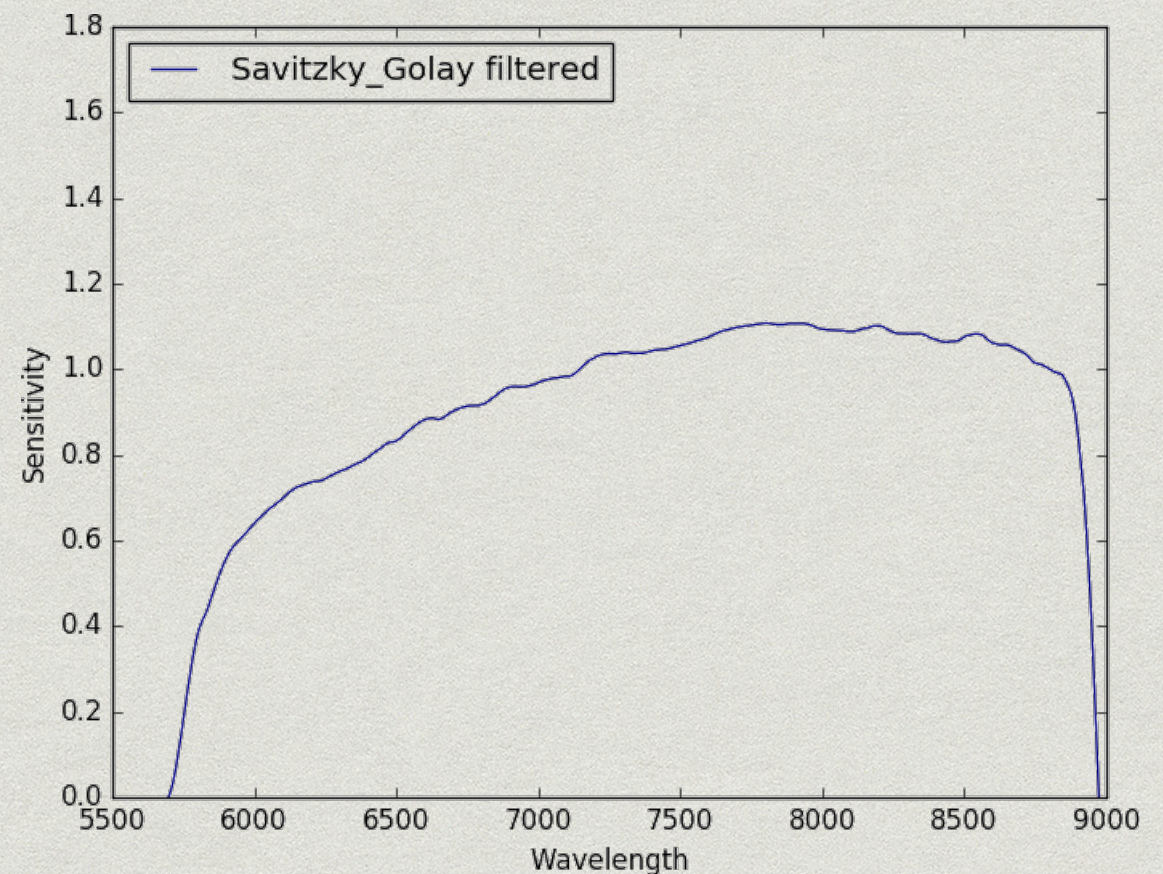




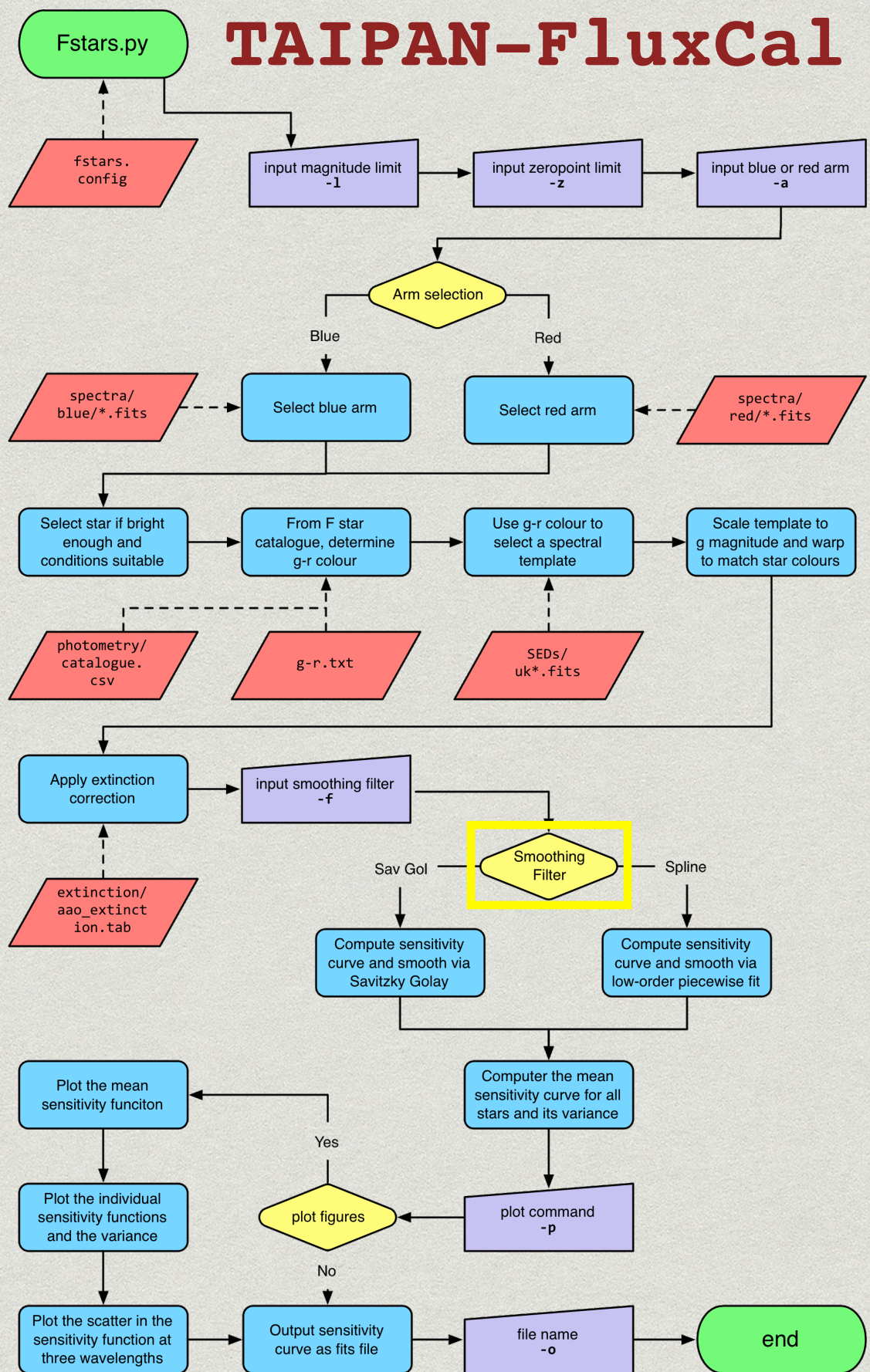


## Plots

- The individual sensitivity functions and the variance
- The scatter in the sensitivity function at three wavelengths
- **The mean sensitivity function**

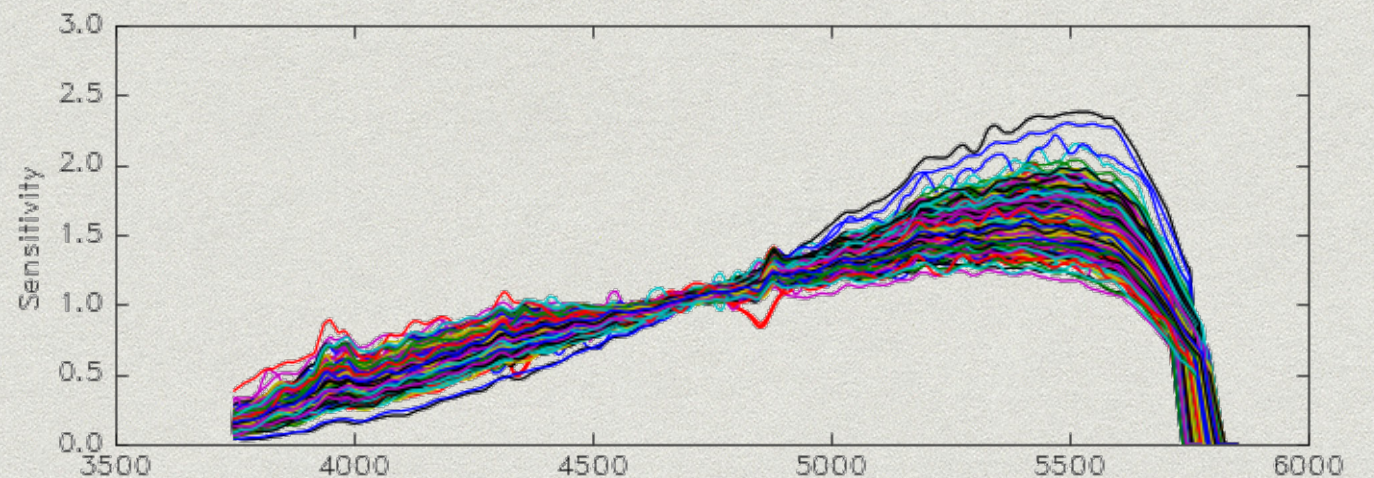




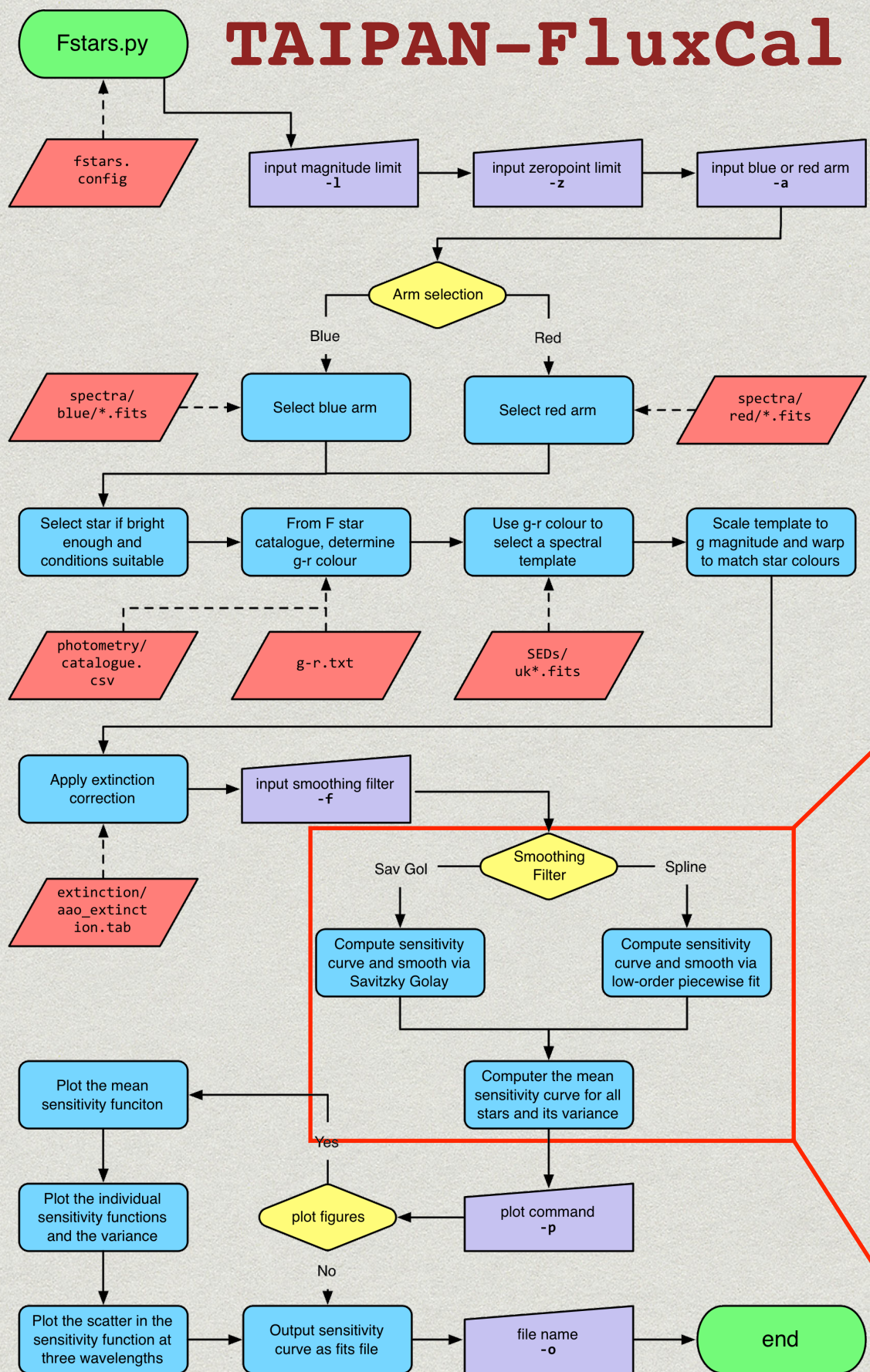


## Smoothing Filter

- Originally written using a Savitzky-Golay smoothing algorithm
- Concerns over too many high order wiggles

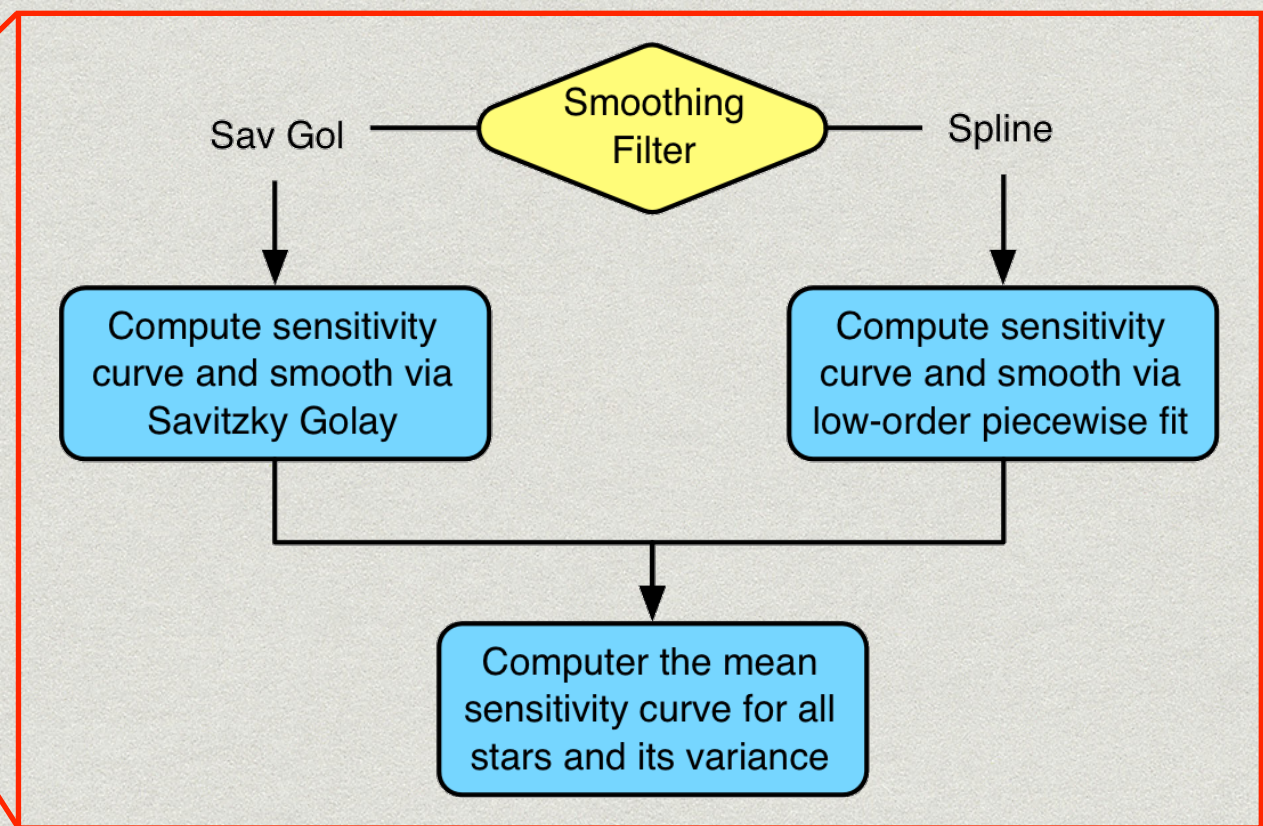




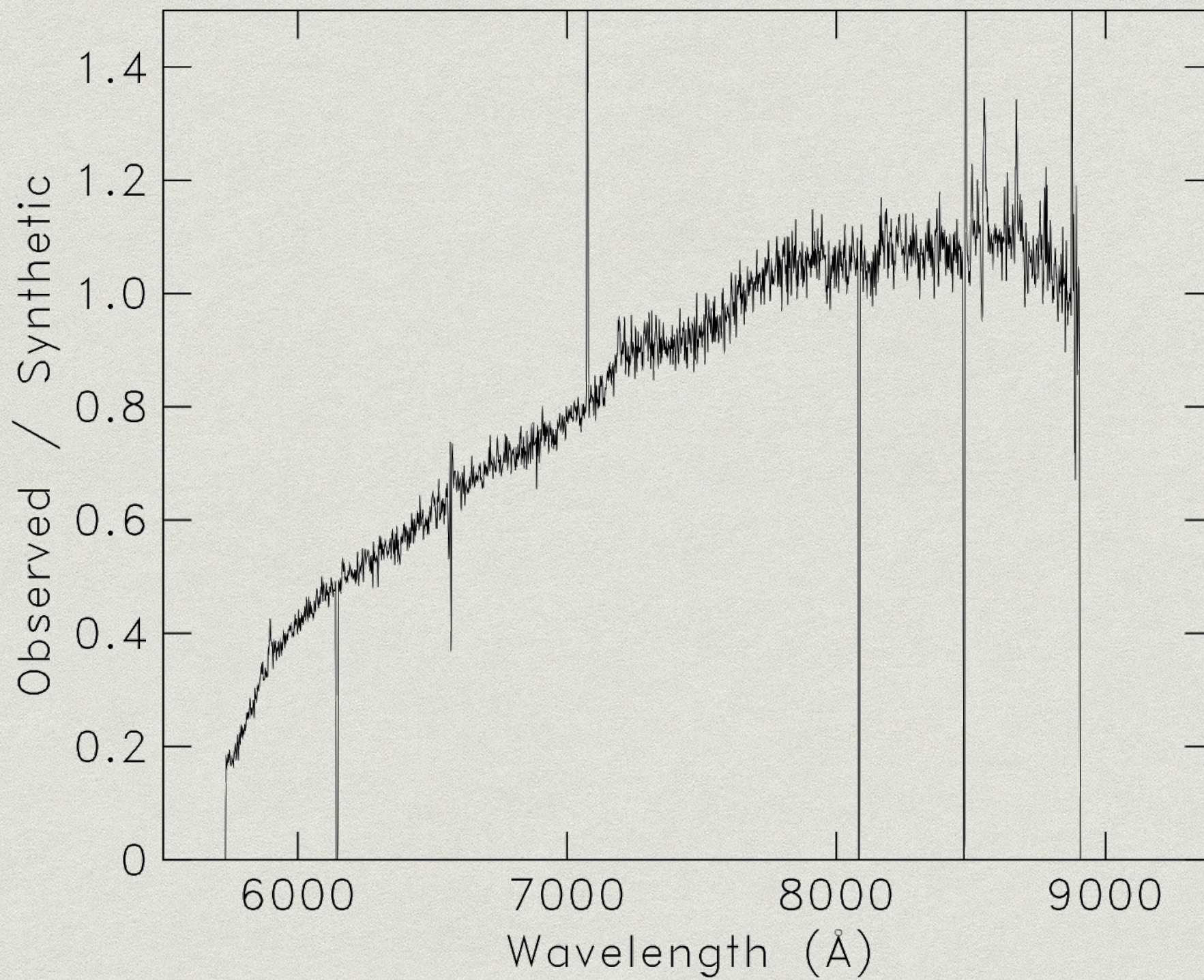


## Smoothing Filter

- Originally written using a Savitzky-Golay smoothing algorithm
- Concerns over too many high order wiggles

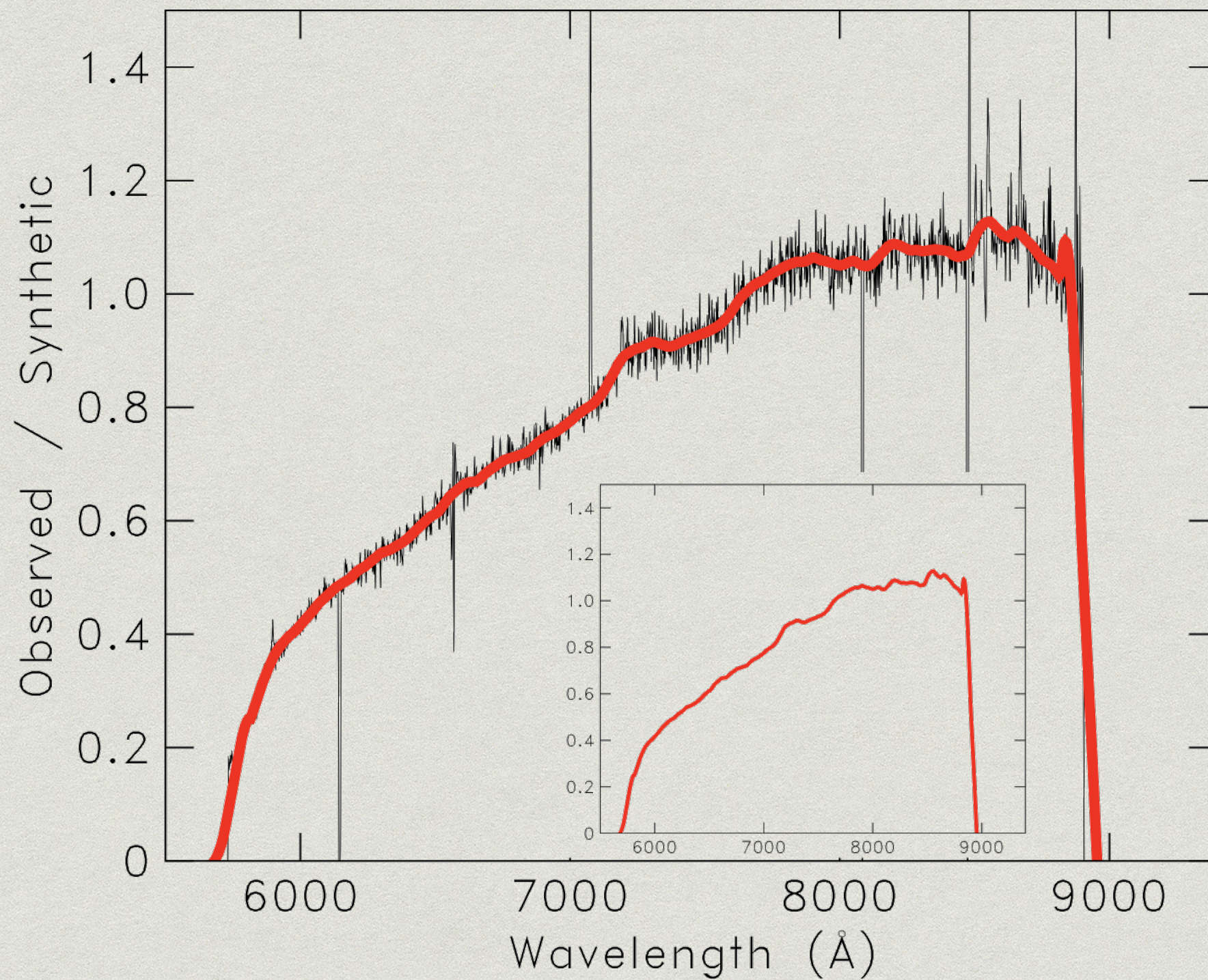






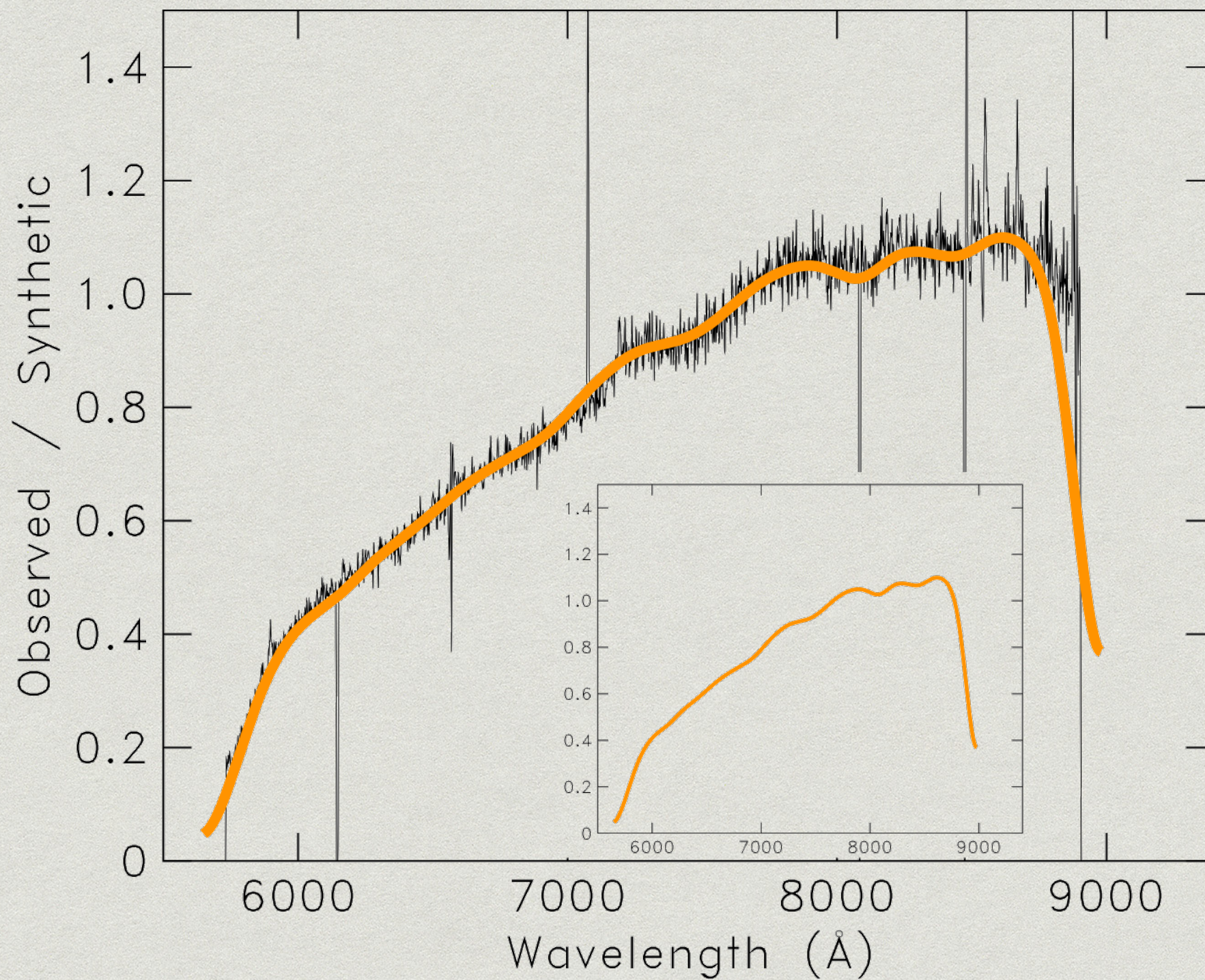


# SAVITZKY-GOLAY



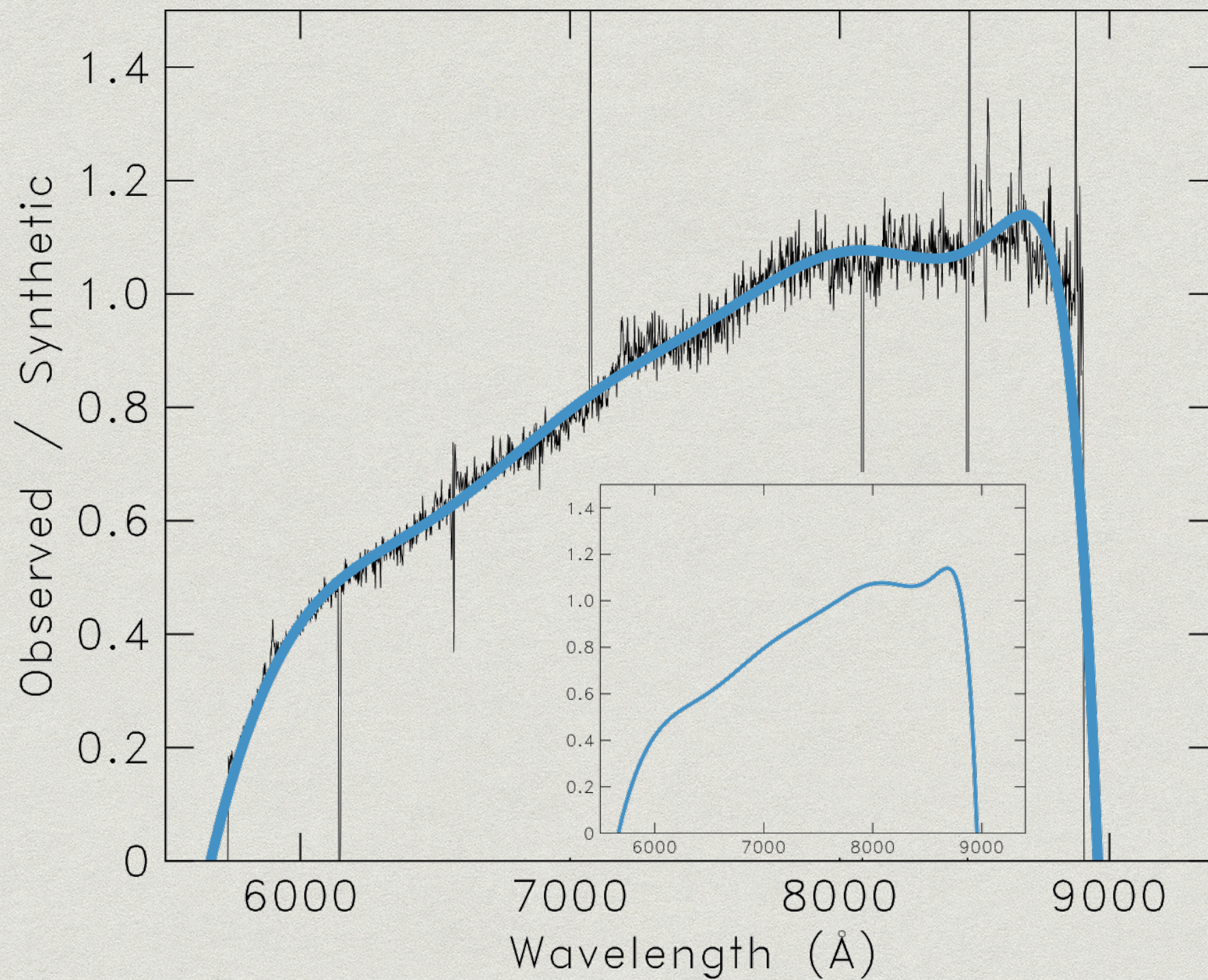


# GAUSSIAN



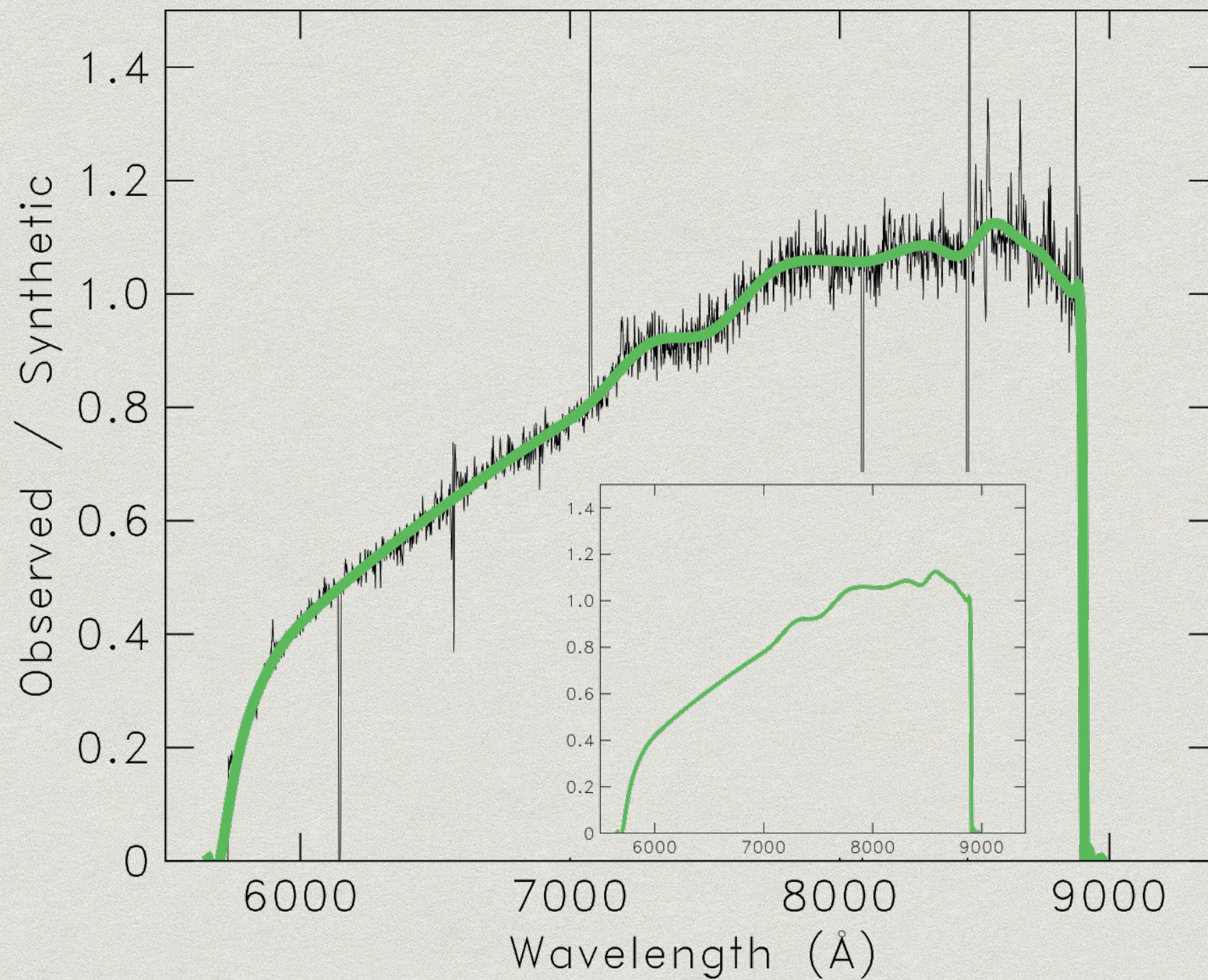


# POLYNOMIAL



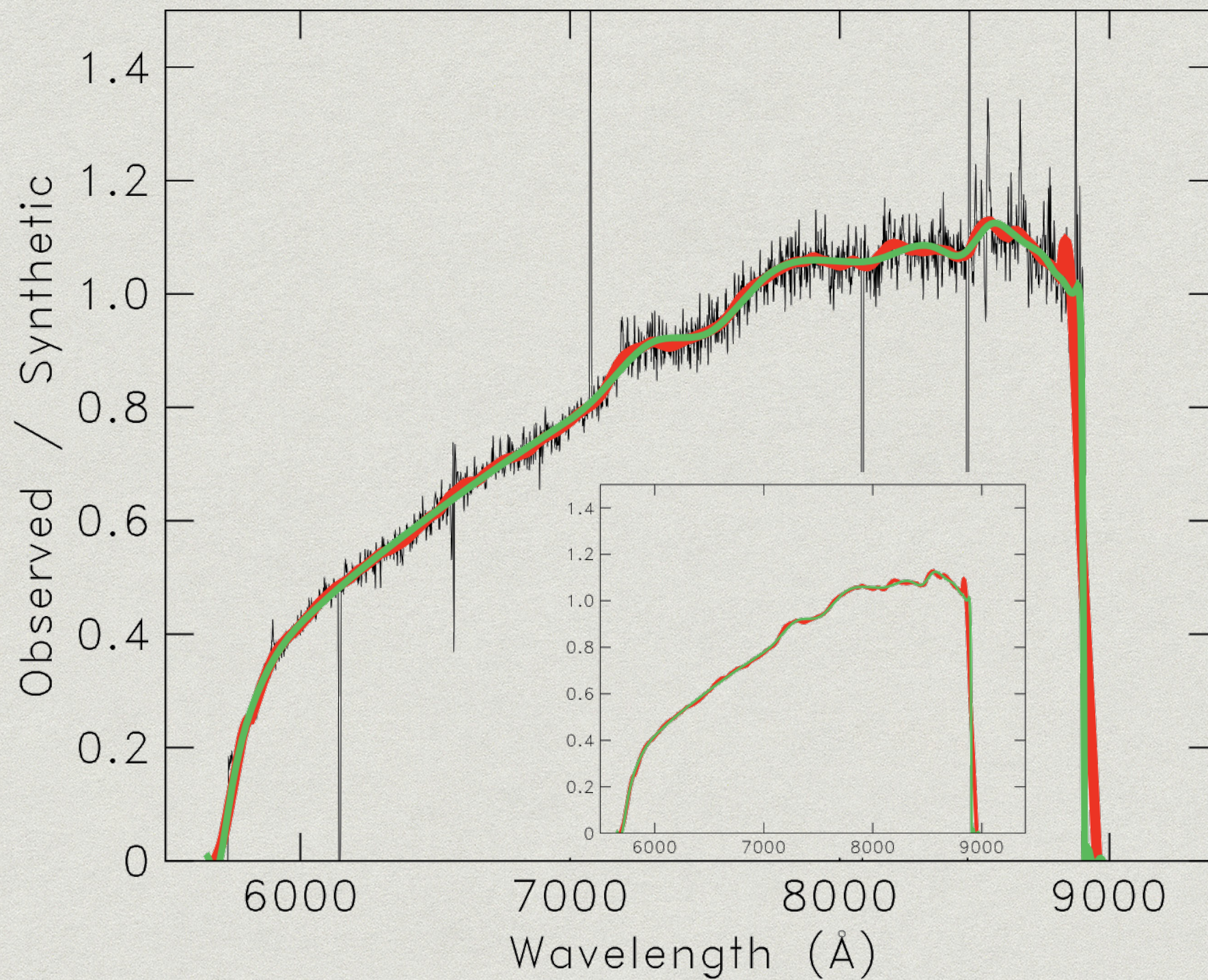


# SPLINE INTERPOLATION



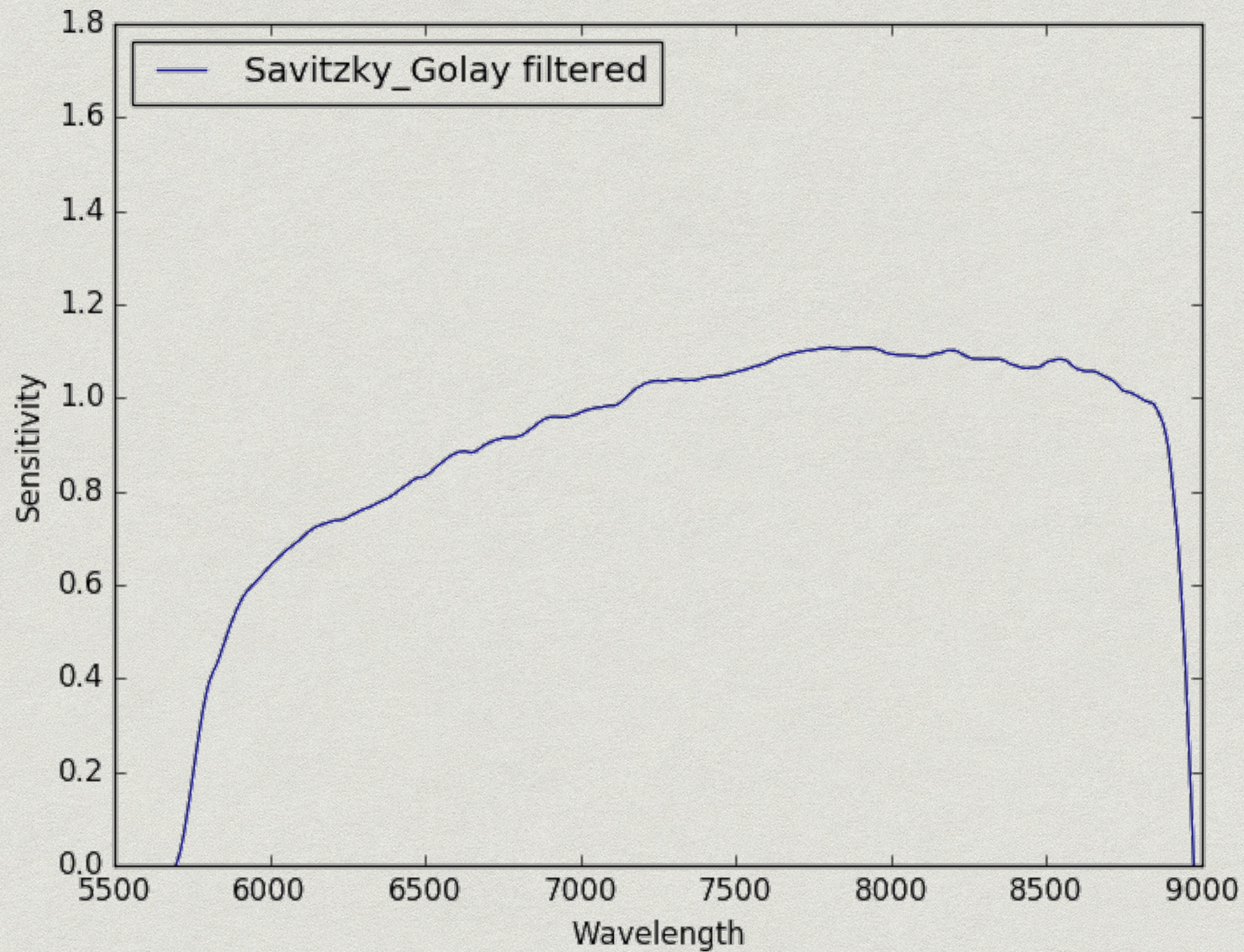


## SAVITZKY-GOLAY vs. SPLINE INTERPOLATION



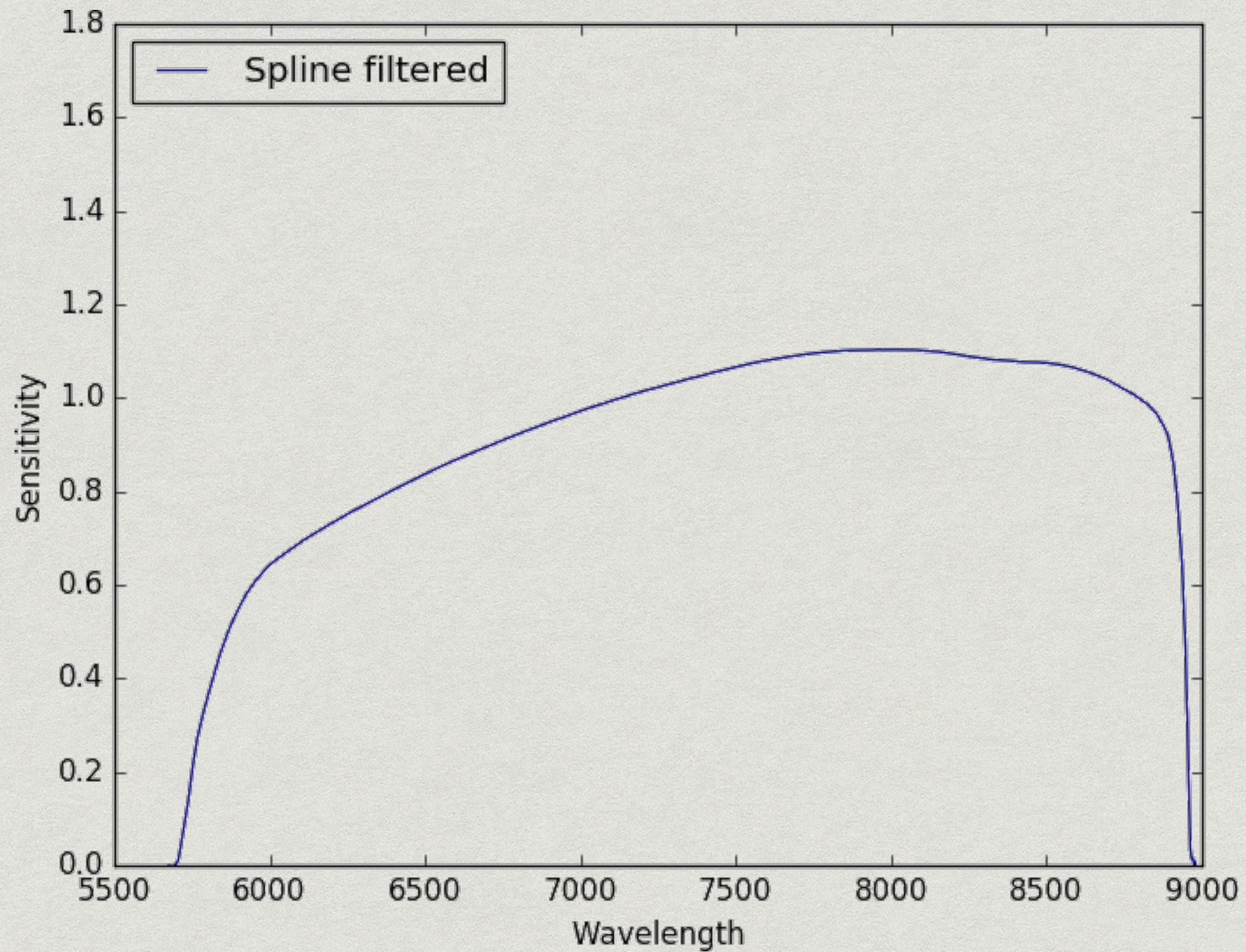


# SAVITZKY-GOLAY





# SPLINE INTERPOLATION





# GITHUB REPOSITORY

<https://github.com/mjcowley/TAIPAN-FluxCal>

mjcowley / TAIPAN-FluxCal Private

Unwatch 2 Star 0 Fork 0

<> Code

Issues 0

Pull requests 0

Wiki

Pulse

Graphs

Settings

Python program to compute sensitivity functions for Taipan — Edit

33 commits

2 branches

0 releases

1 contributor

Branch: master

New pull request

Create new file

Upload files

Find file


Clone or download

mjcowley Plot Correction

Latest commit 29f0b51 9 minutes ago

SEDs	Updates	a month ago
extinction	Header Corrections	a month ago
filters	Updates	a month ago
photometry	Updates	a month ago
spectra	Updates	a month ago
README.md	Plot Correction	9 minutes ago
fstars.config	Configuration file for F star analysis	a month ago
fstars.py	Plot Correction	29 days ago
g-r.txt	Header corrections	a month ago

README.md



## The Taipan Galaxy Survey

Python program to compute sensitivity functions for **TAIPAN**.

### Directories and files

**spectra/blue/** - spectra of F stars in the blue arm extracted from the files that 2dfdr produces (.fits)  
**spectra/red/** - spectra of F stars in the red arm extracted from the files that 2dfdr produces (.fits)  
**SEDs/** - seven synthetic SEDs for F stars  
**filters/** - filters curves  
**photometry/** - photometry of F stars to determine g-r colours (.csv)  
**extinction/aao\_extinction.tab** - file with atmospheric extinction at the AAT