# 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

AAO

# GOALS

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

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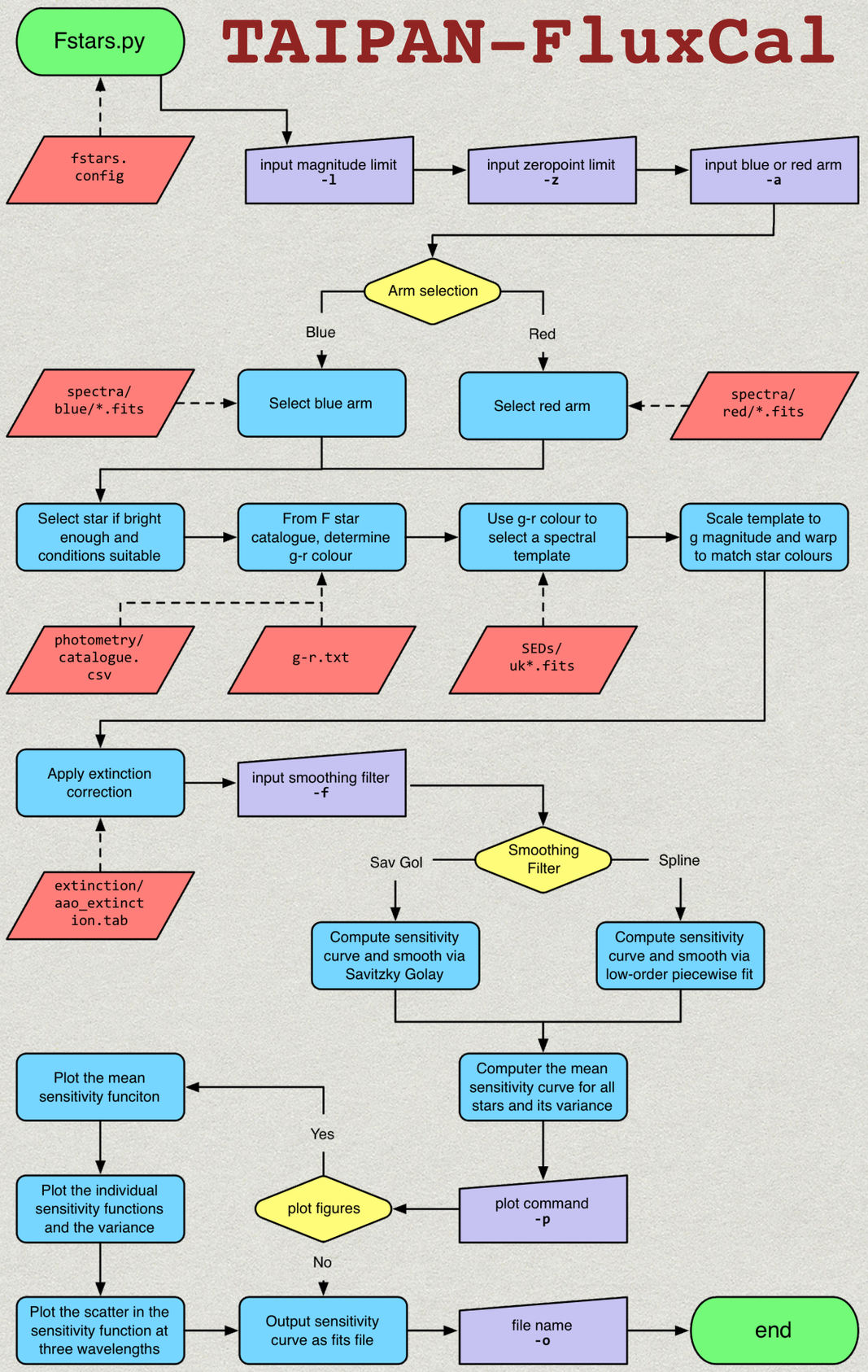
2. Provide simple flux calibration code that can be integrated into the `TLDR` pipeline:

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

# TAIPAN-FluxCal




## Thanks, Chris

zDES

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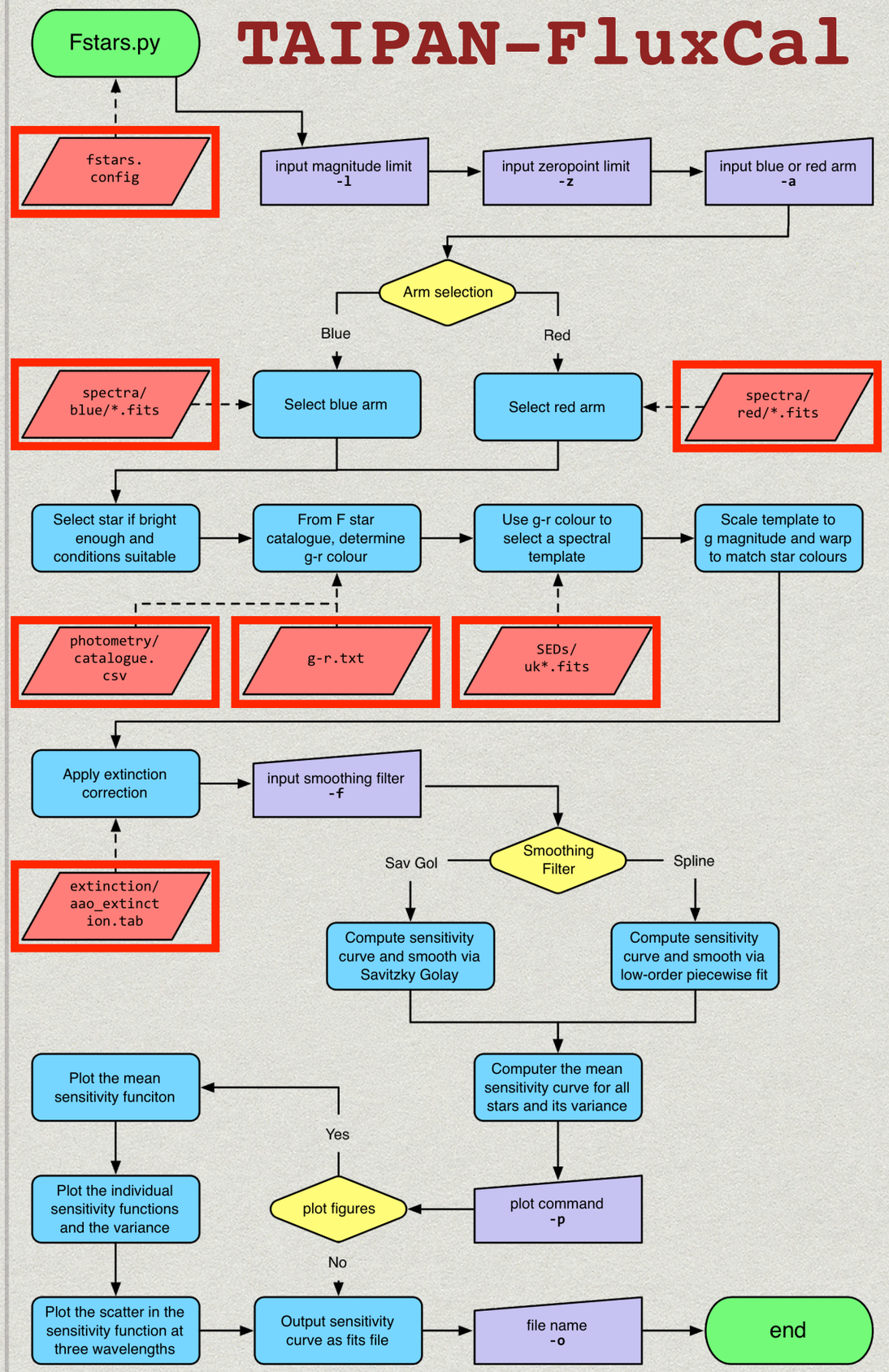
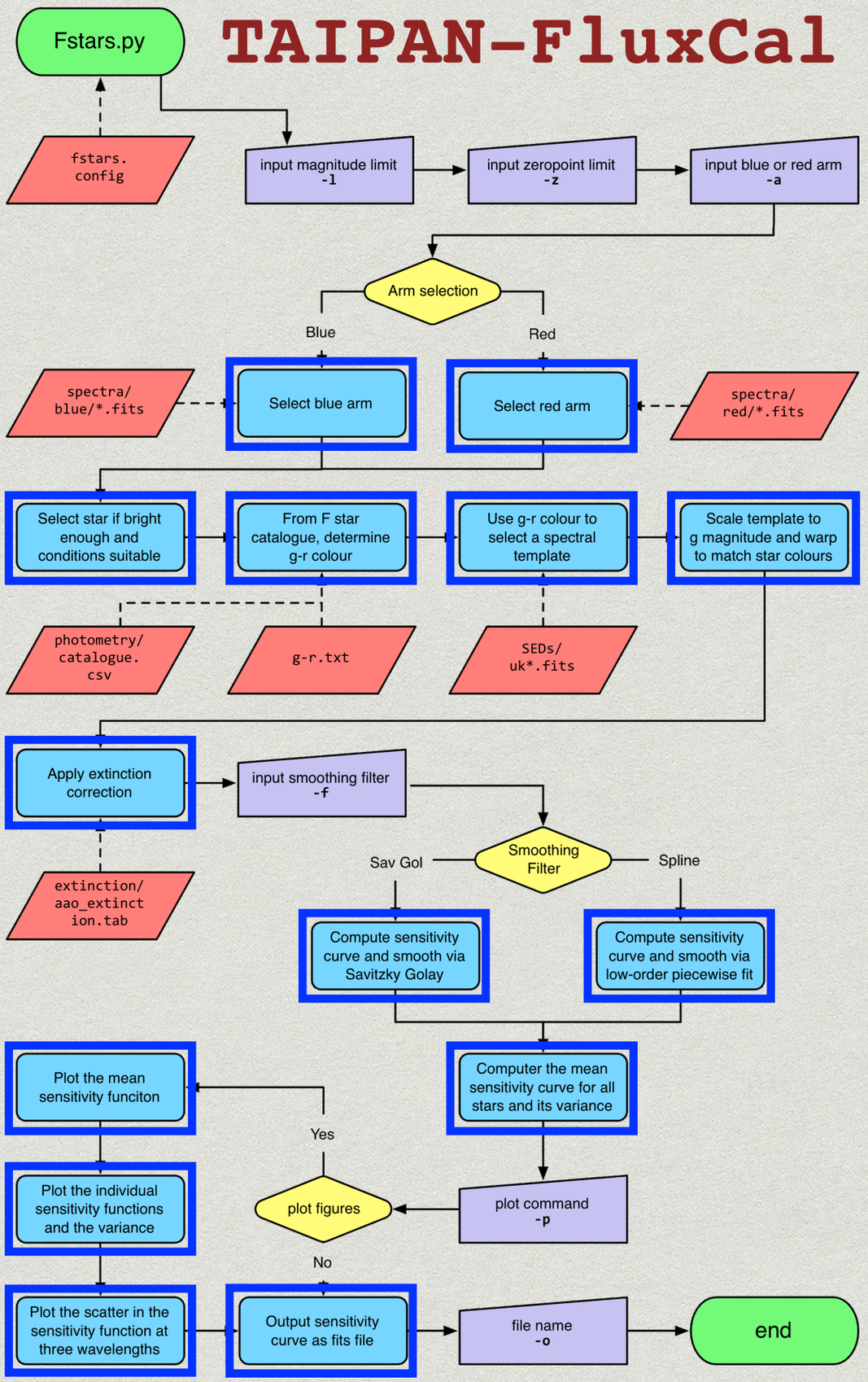



## Inputs

- 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

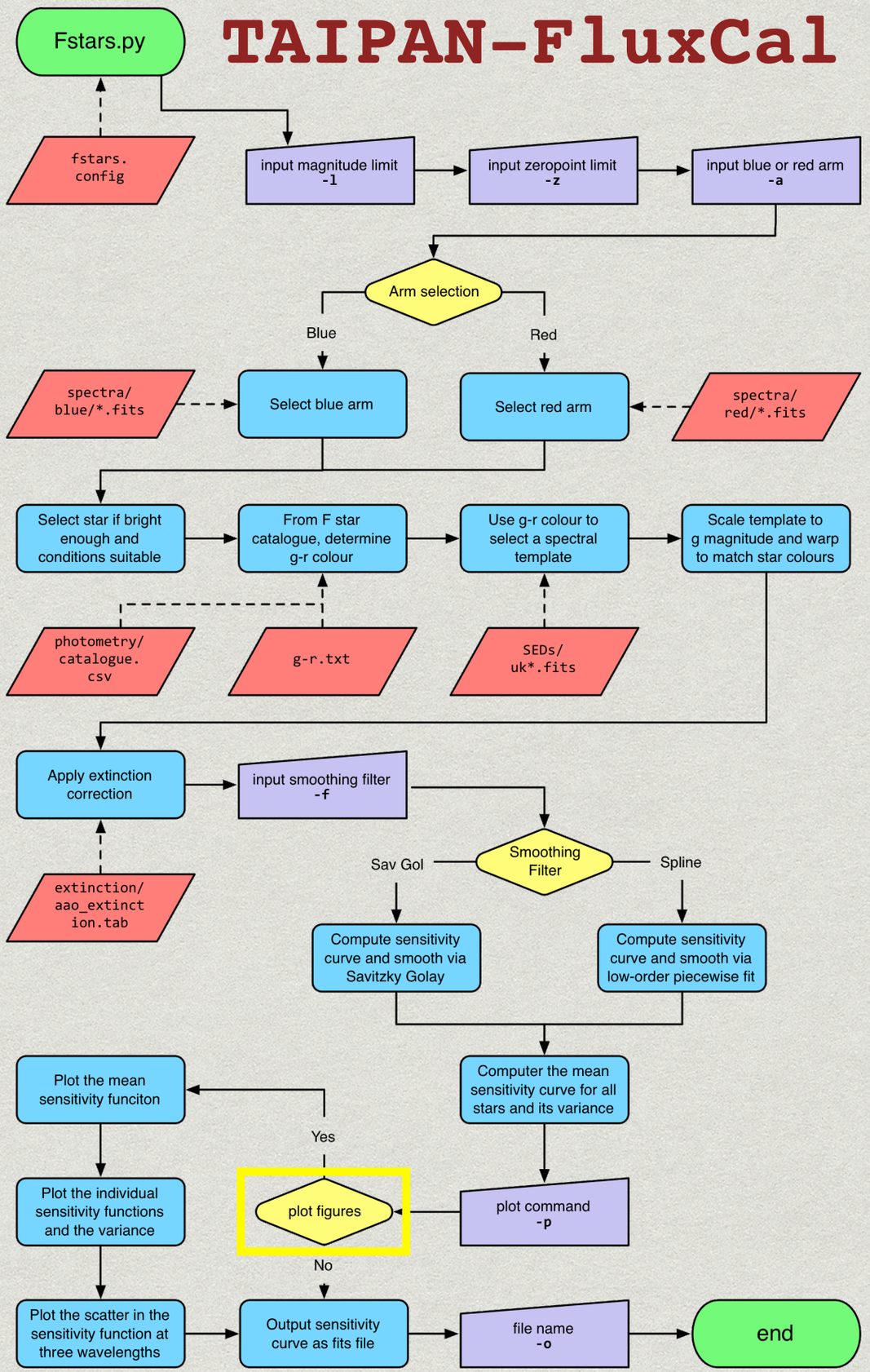
# TAIPAN-FluxCal




## 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

# TAIPAN-FluxCal




## Plots

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

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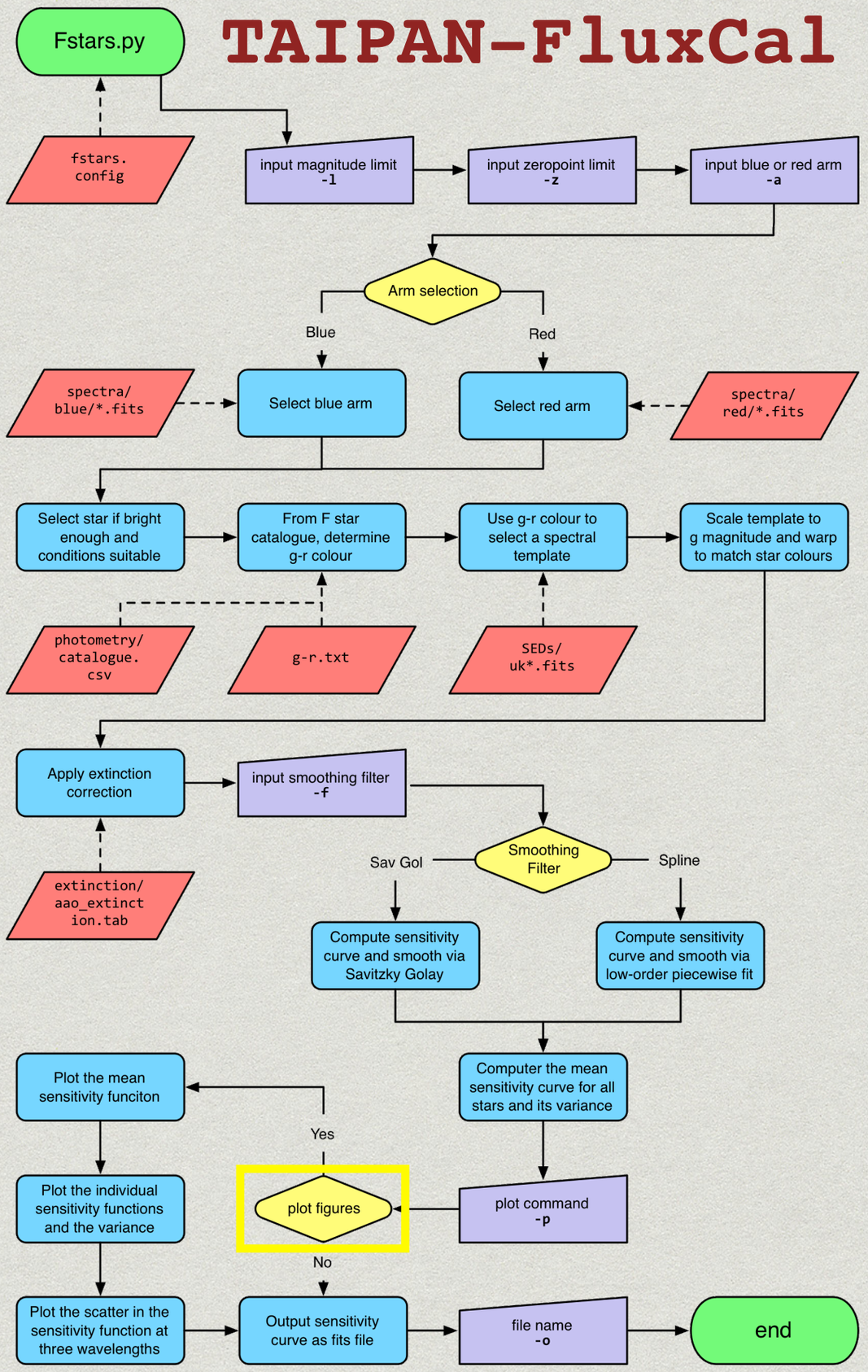


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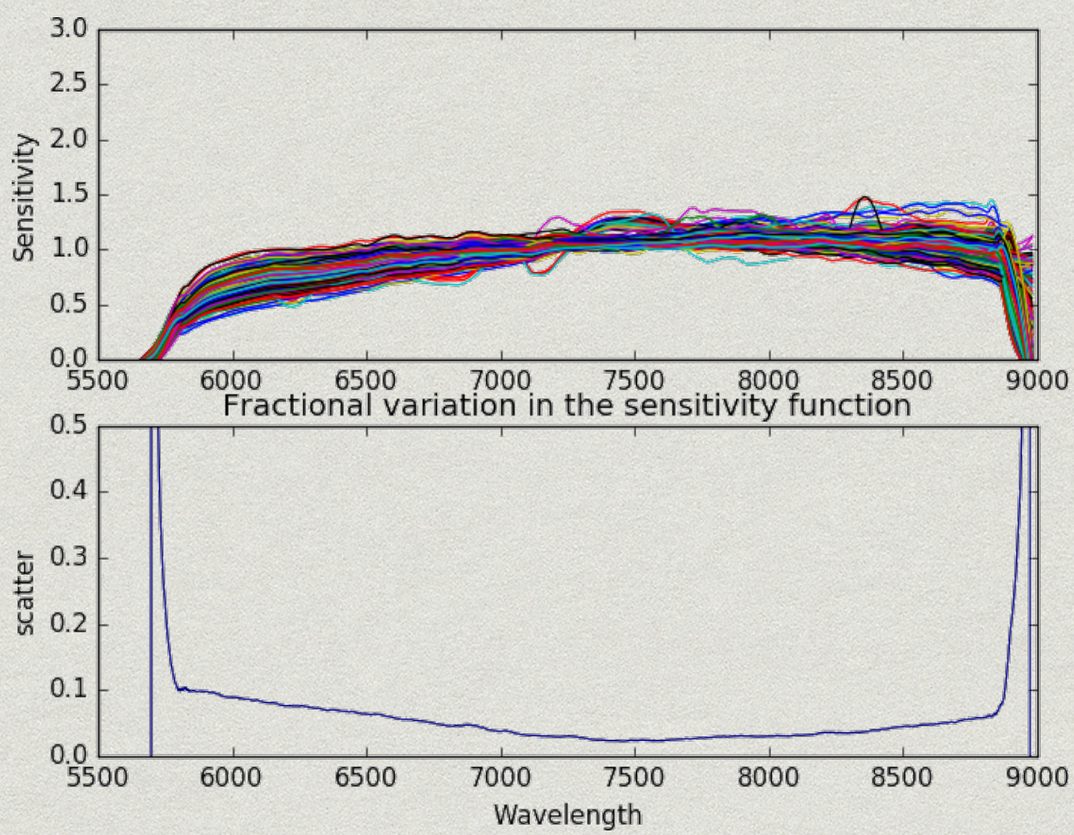

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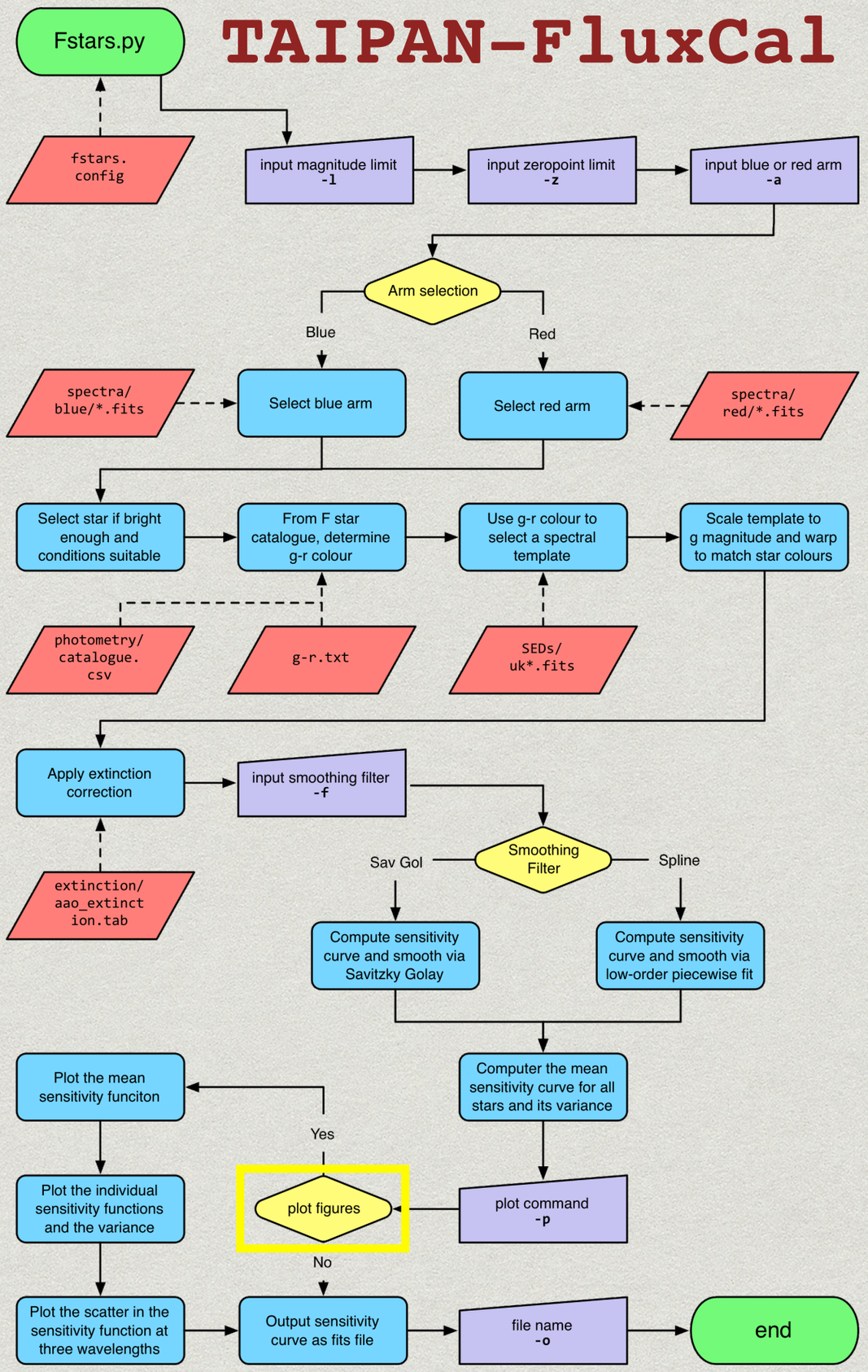


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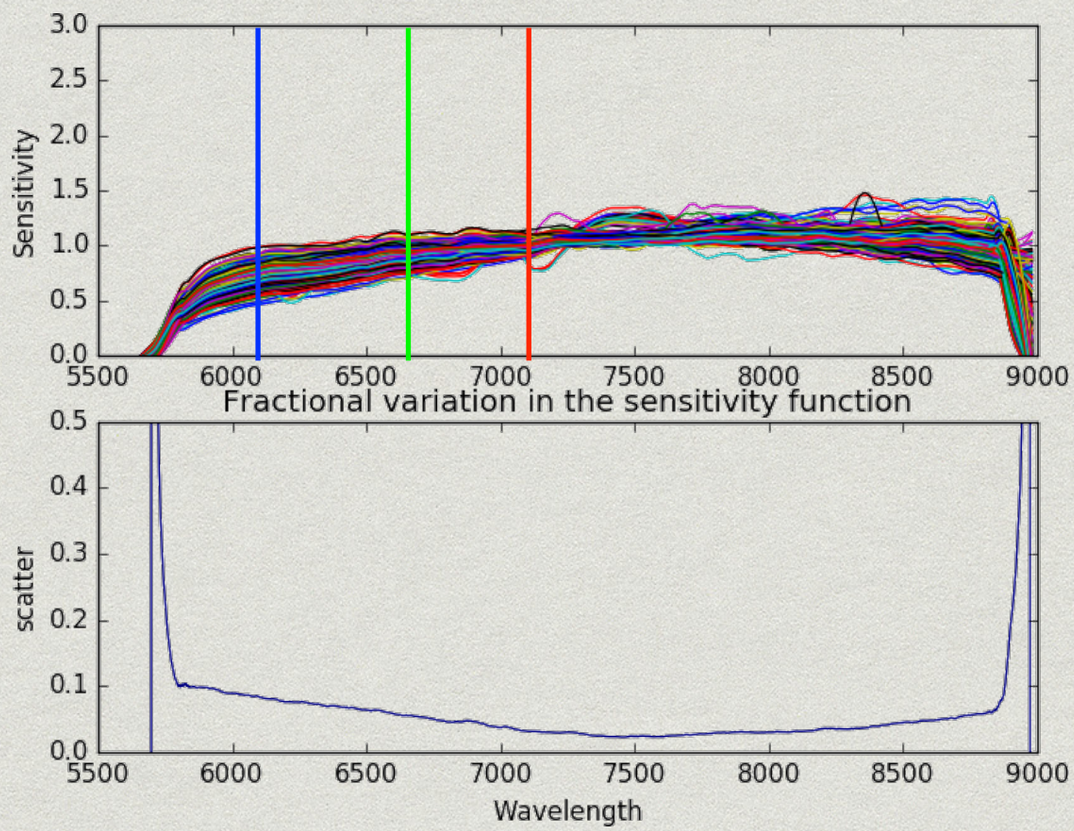

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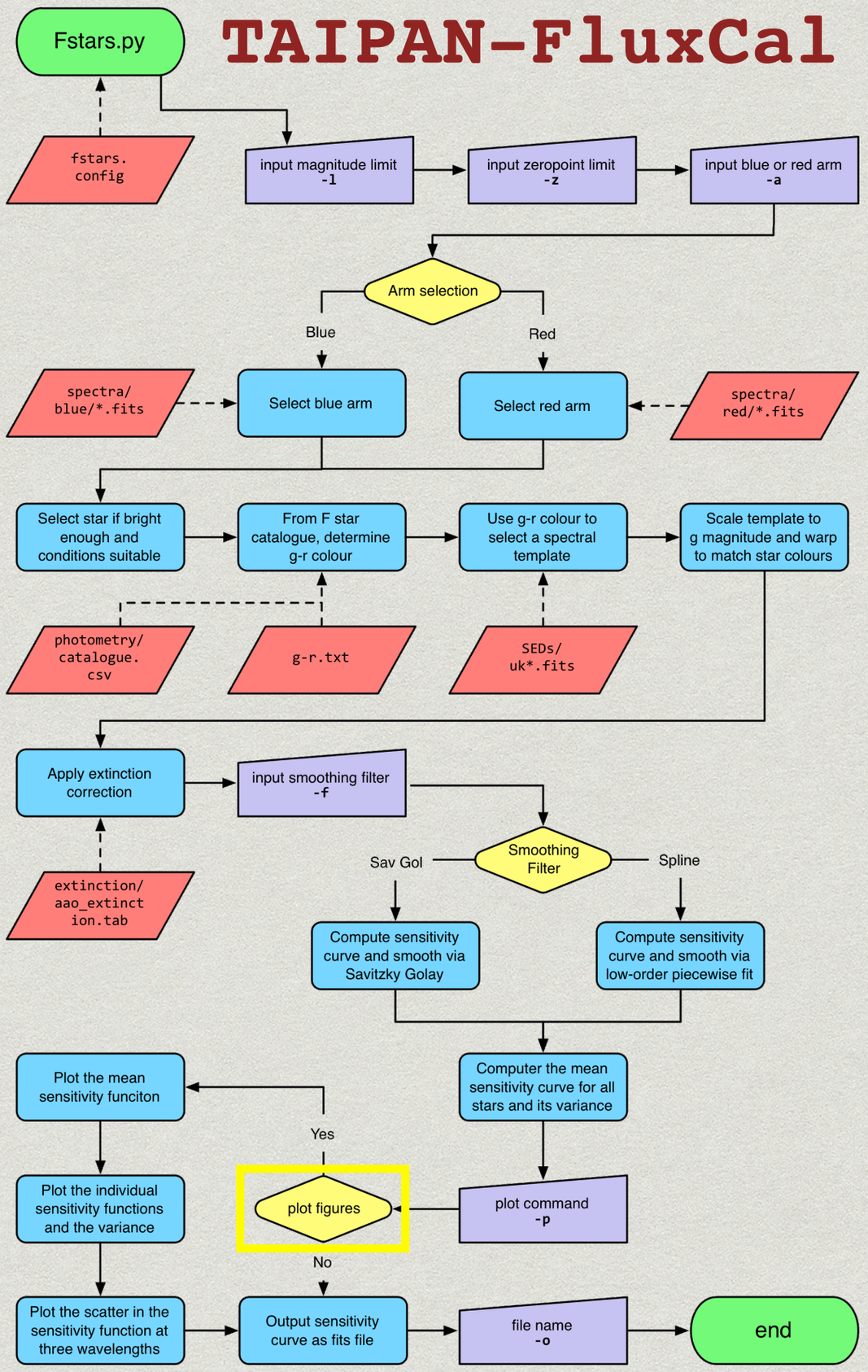


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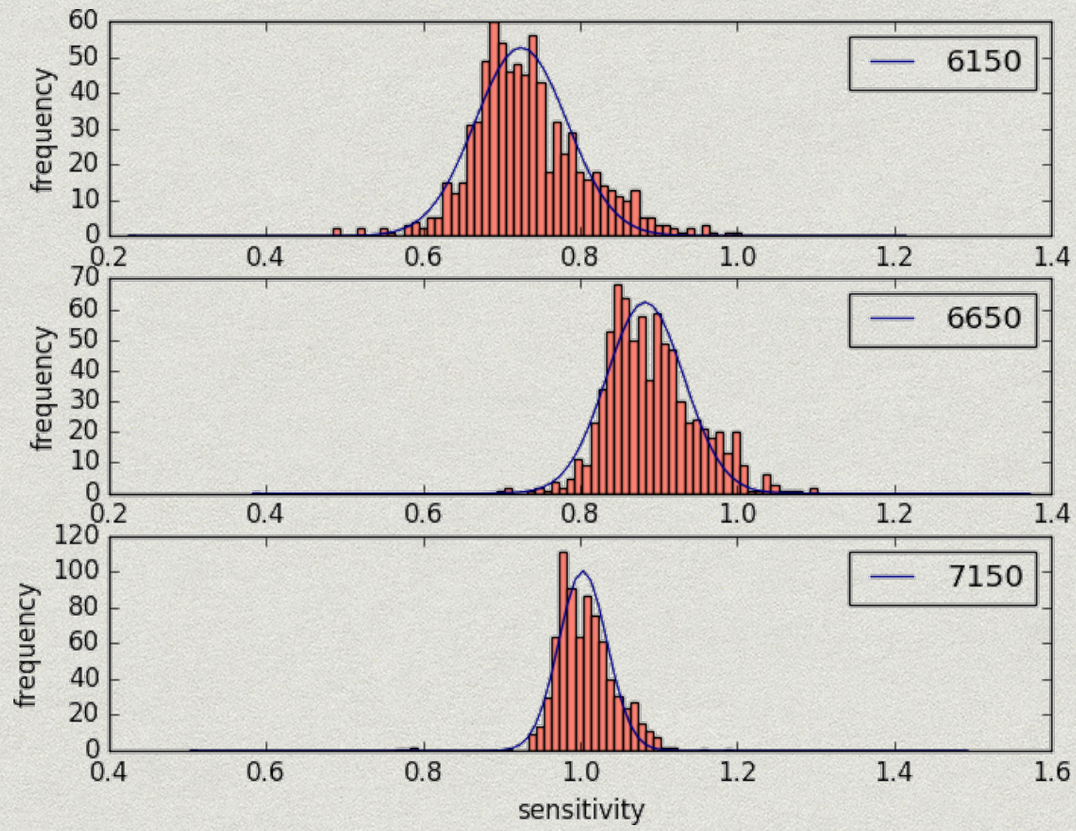

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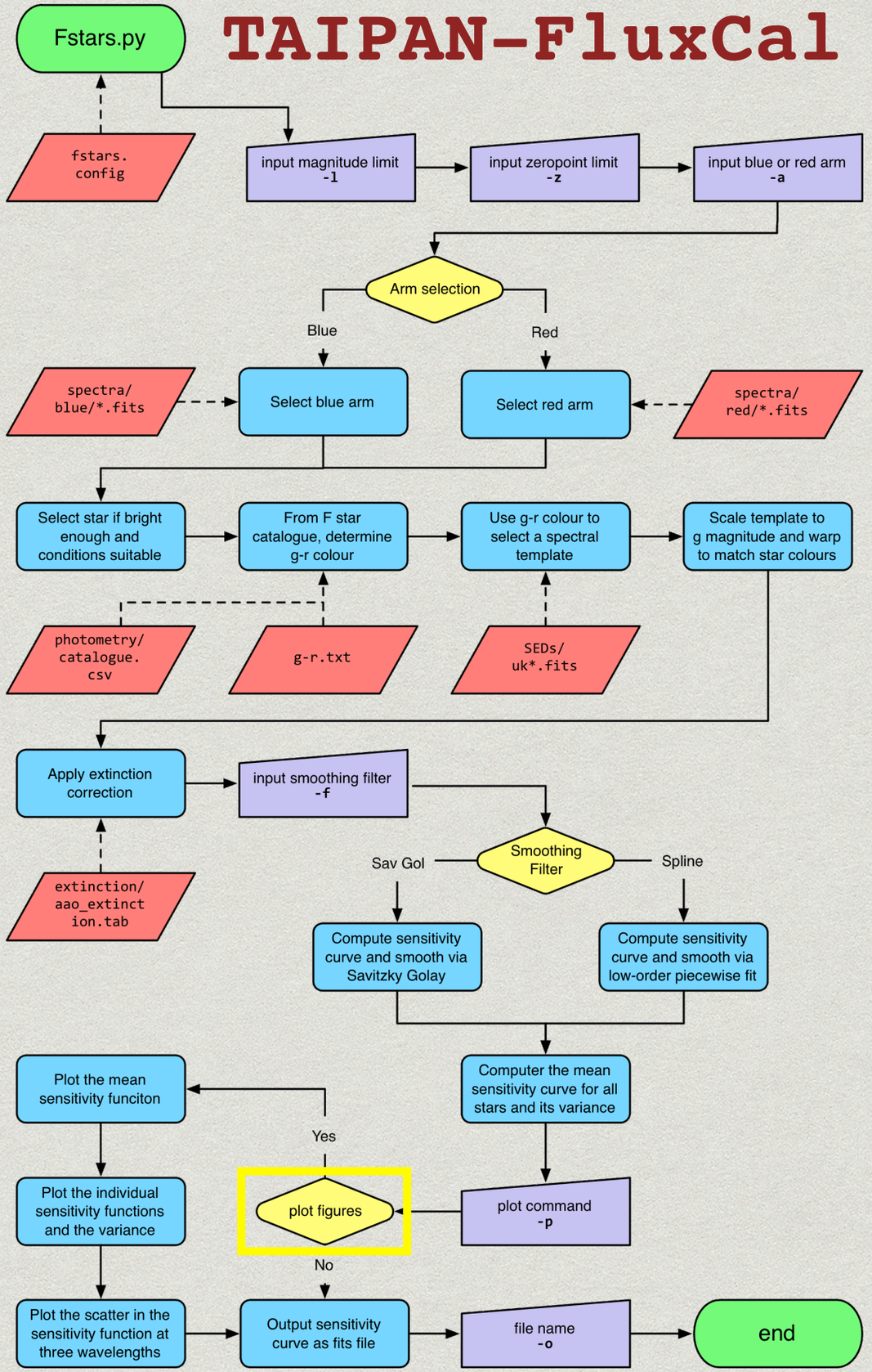


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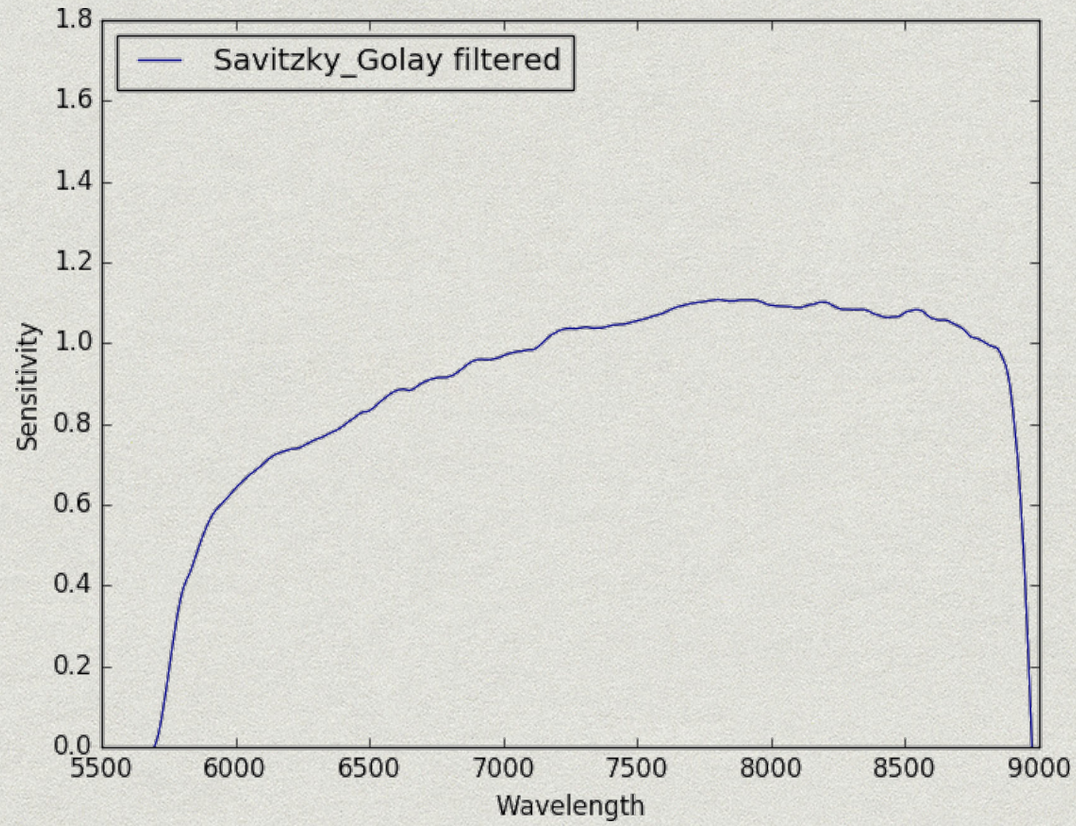

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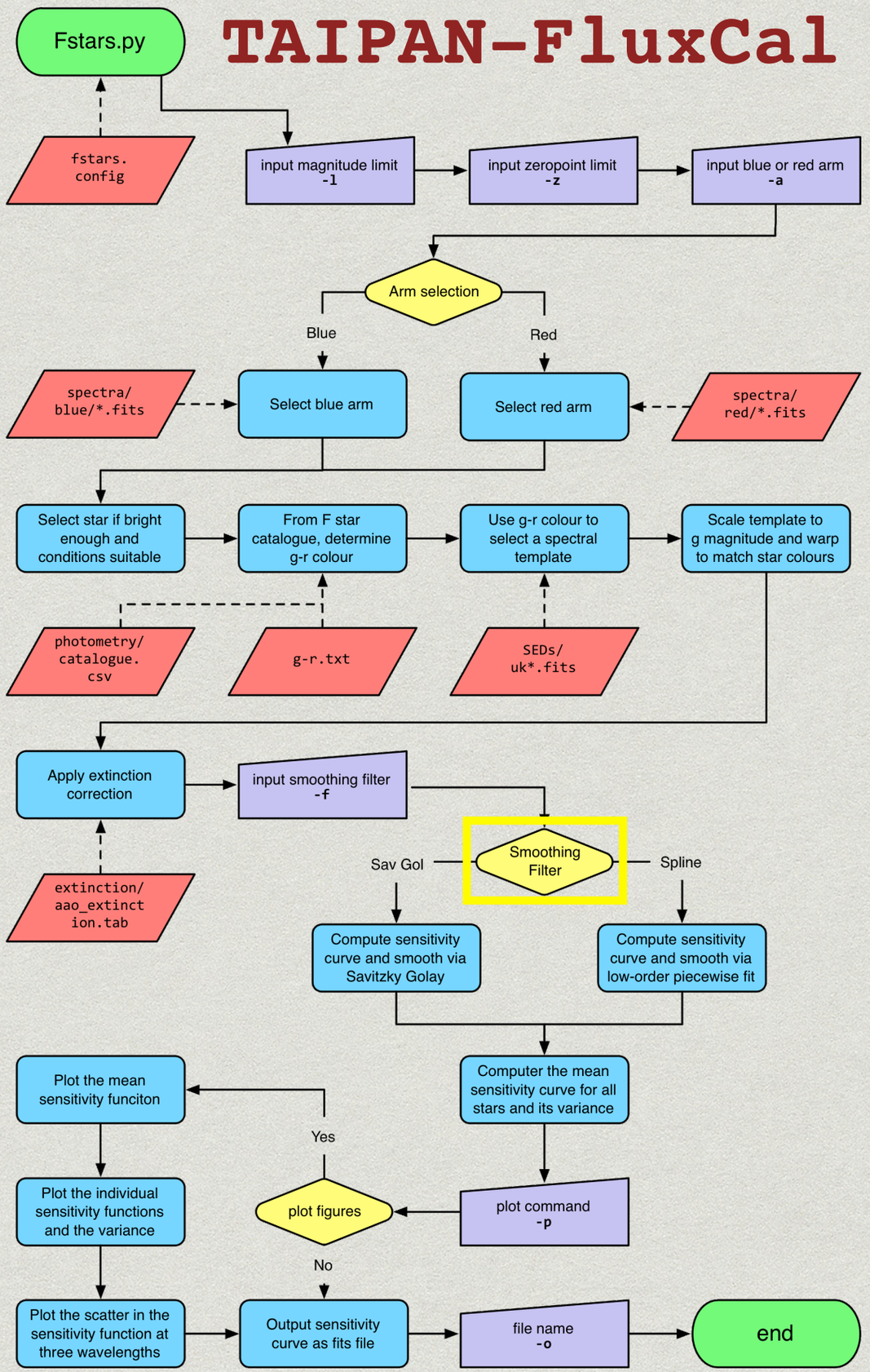
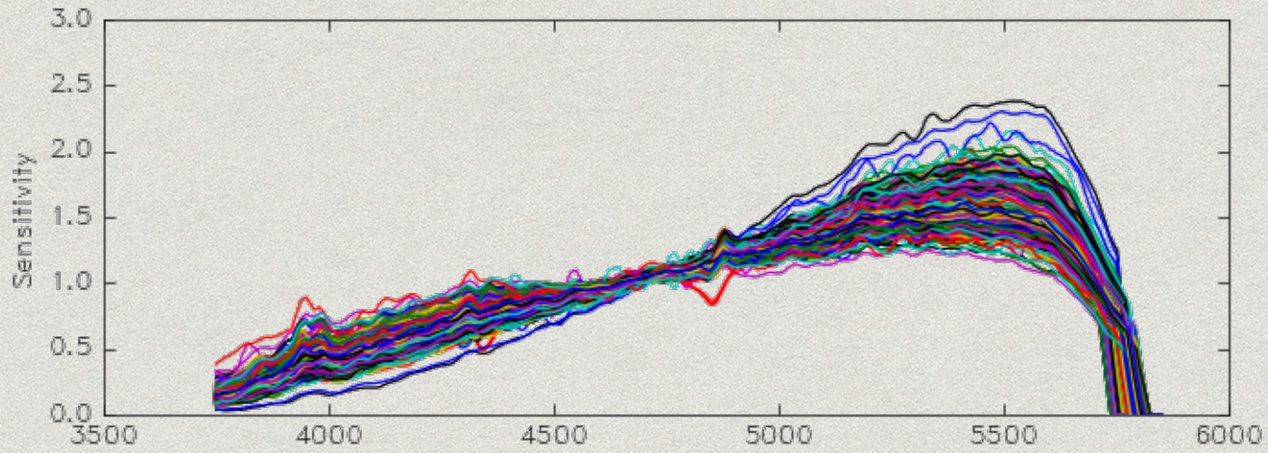



## Smoothing Filter

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



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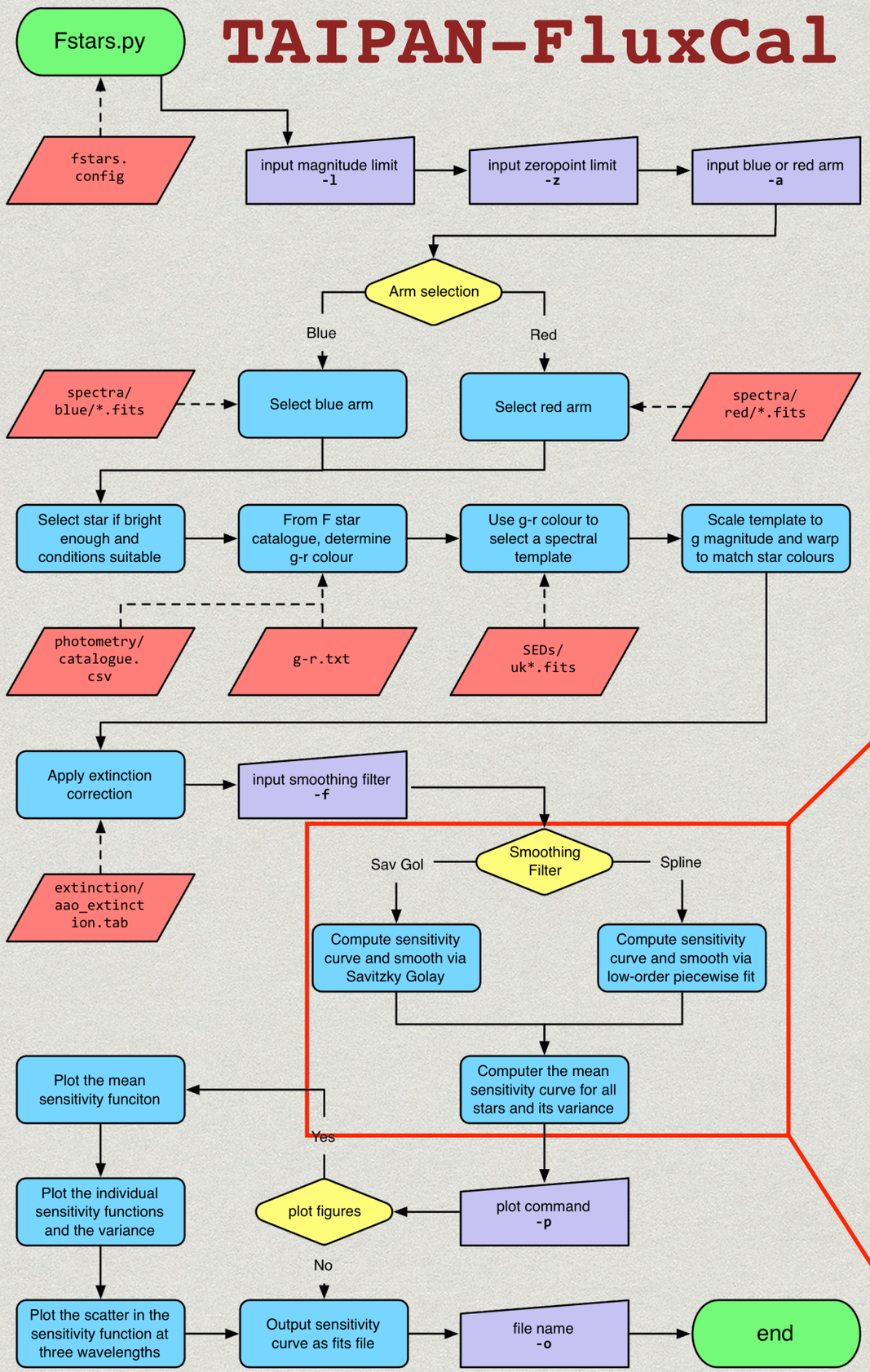


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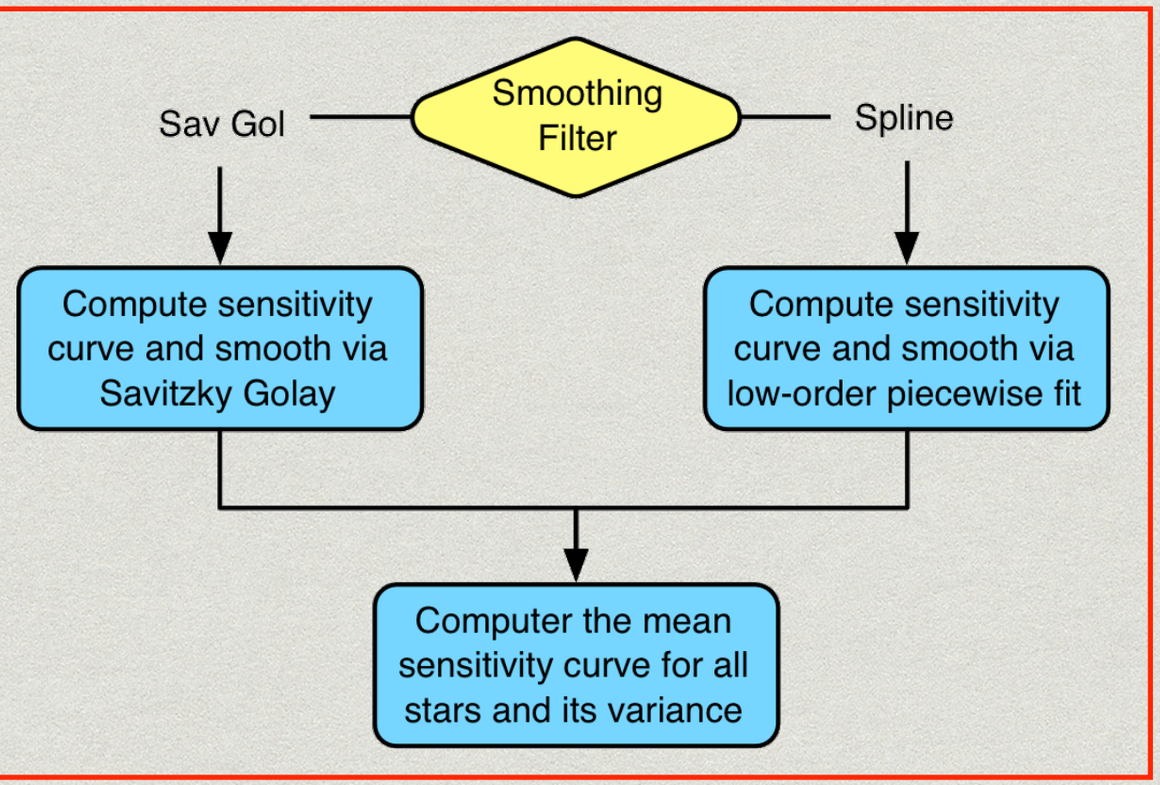
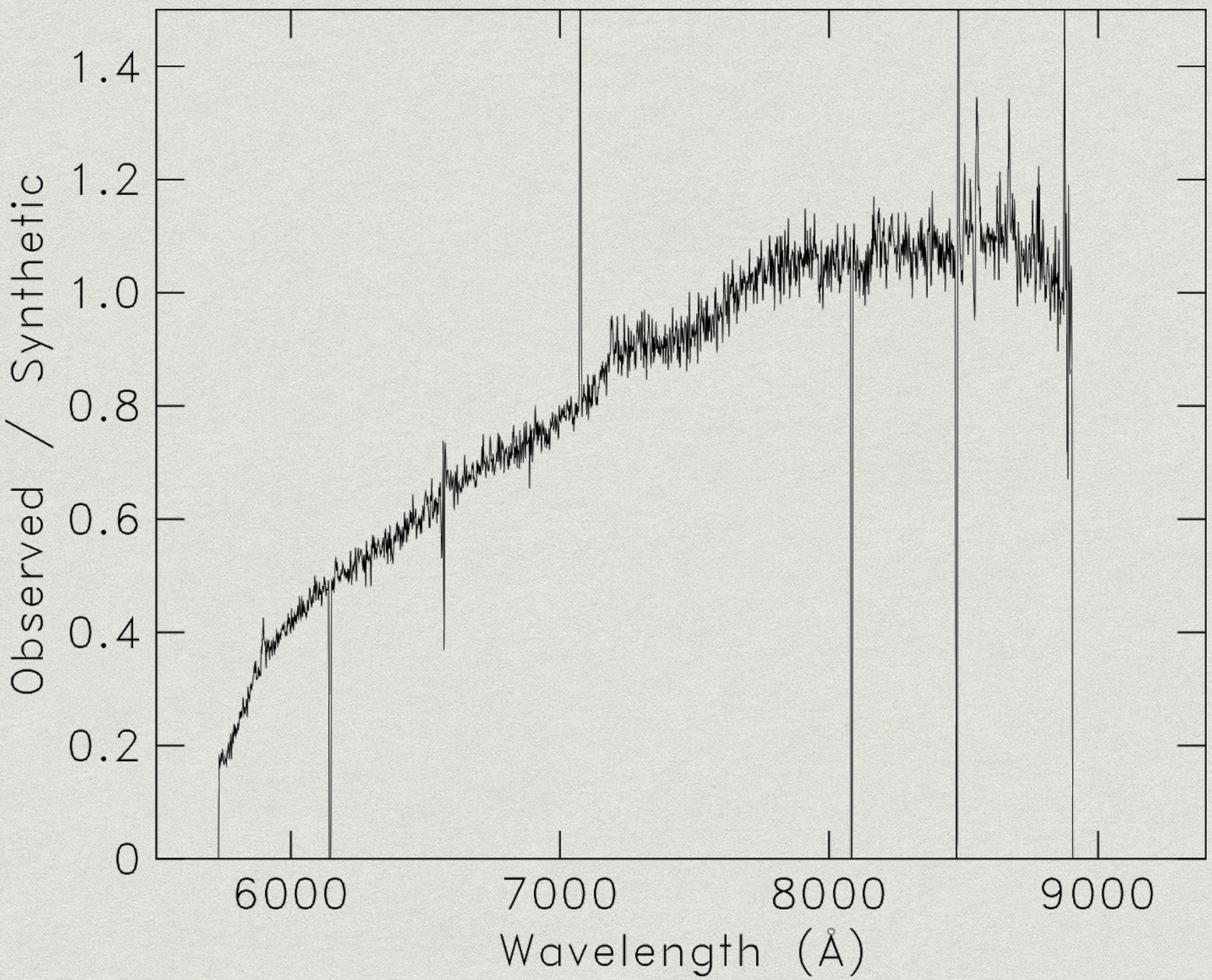
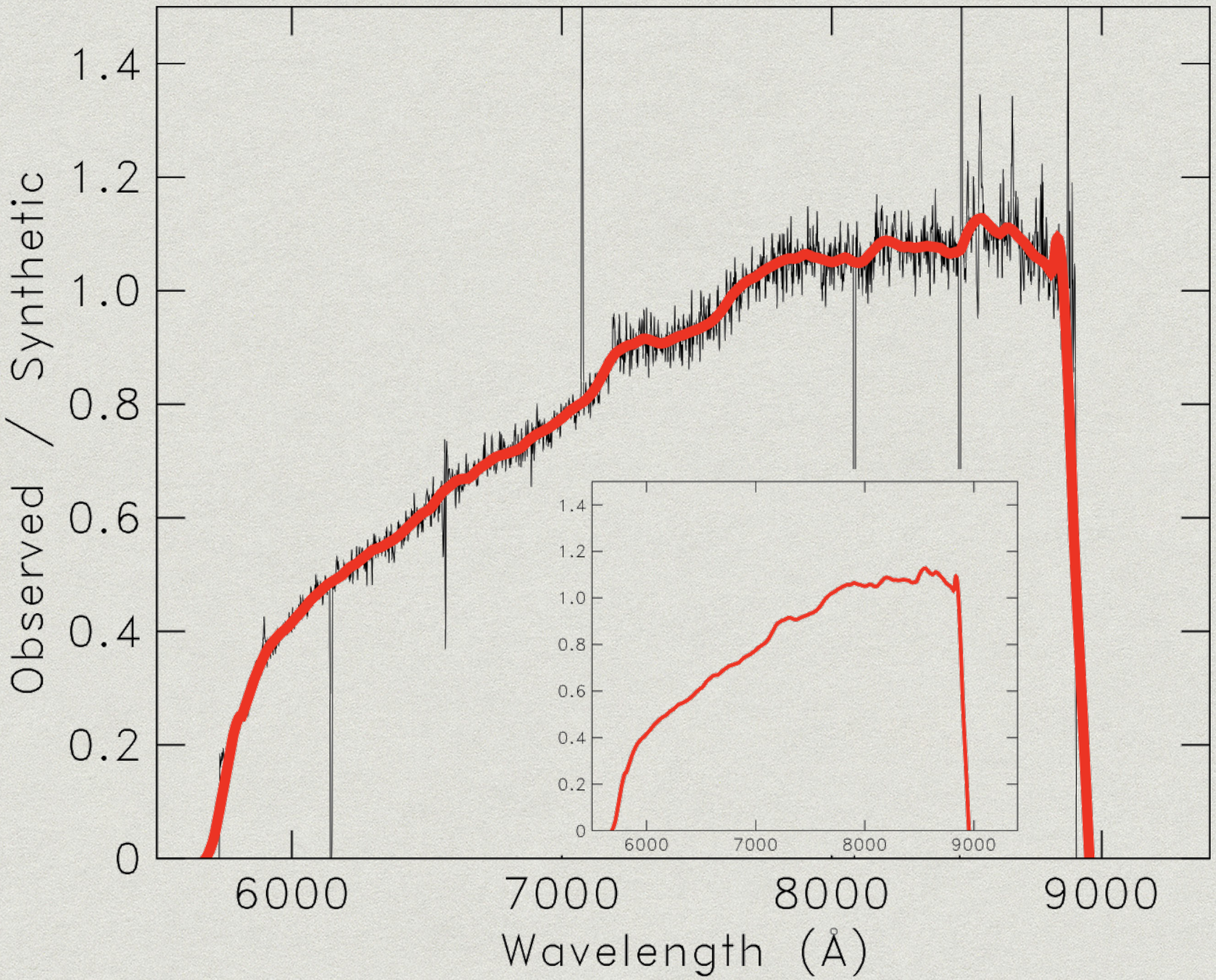
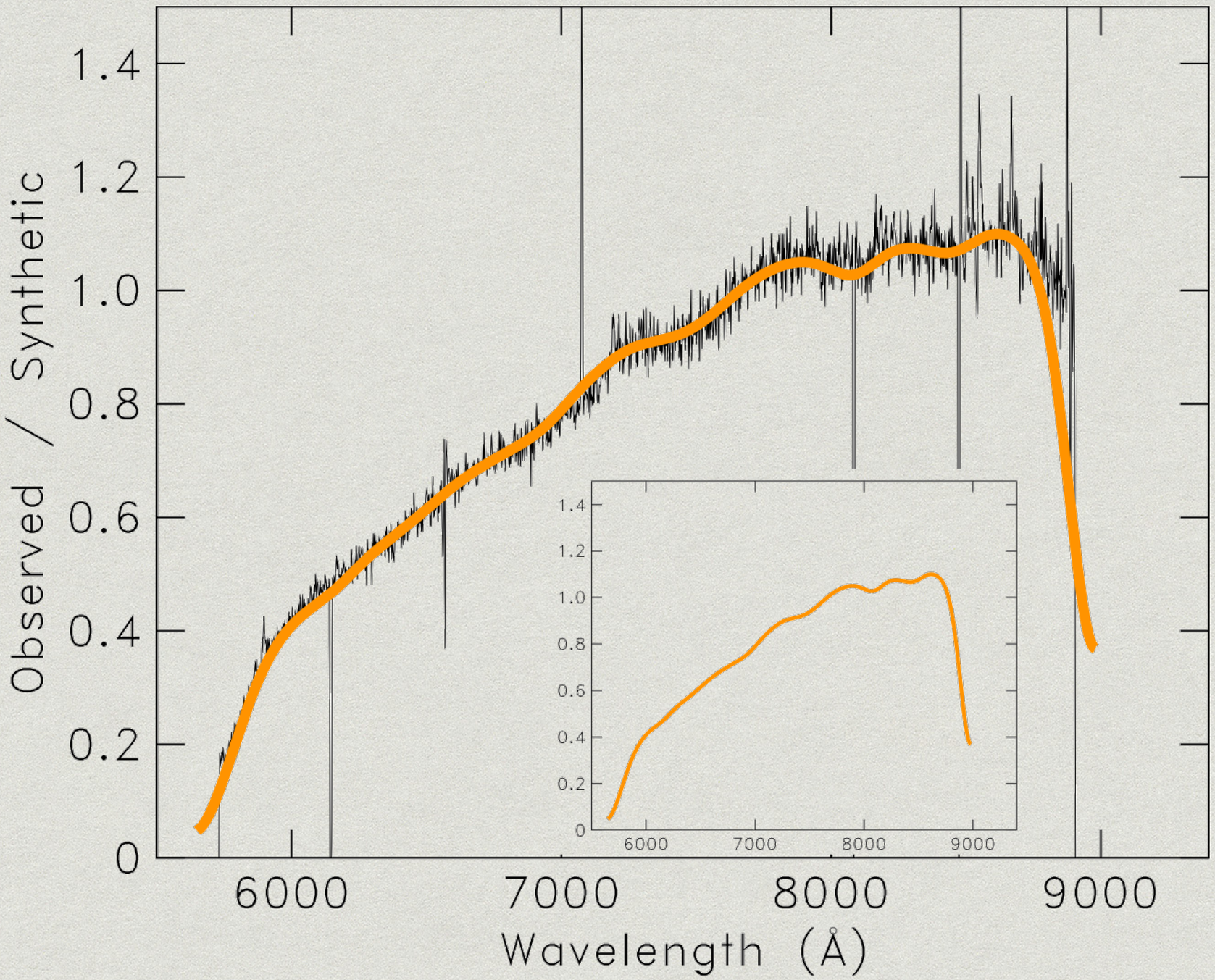



Observed / Synthetic
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
6000
7000
8000
9000
Wavelength (Å)

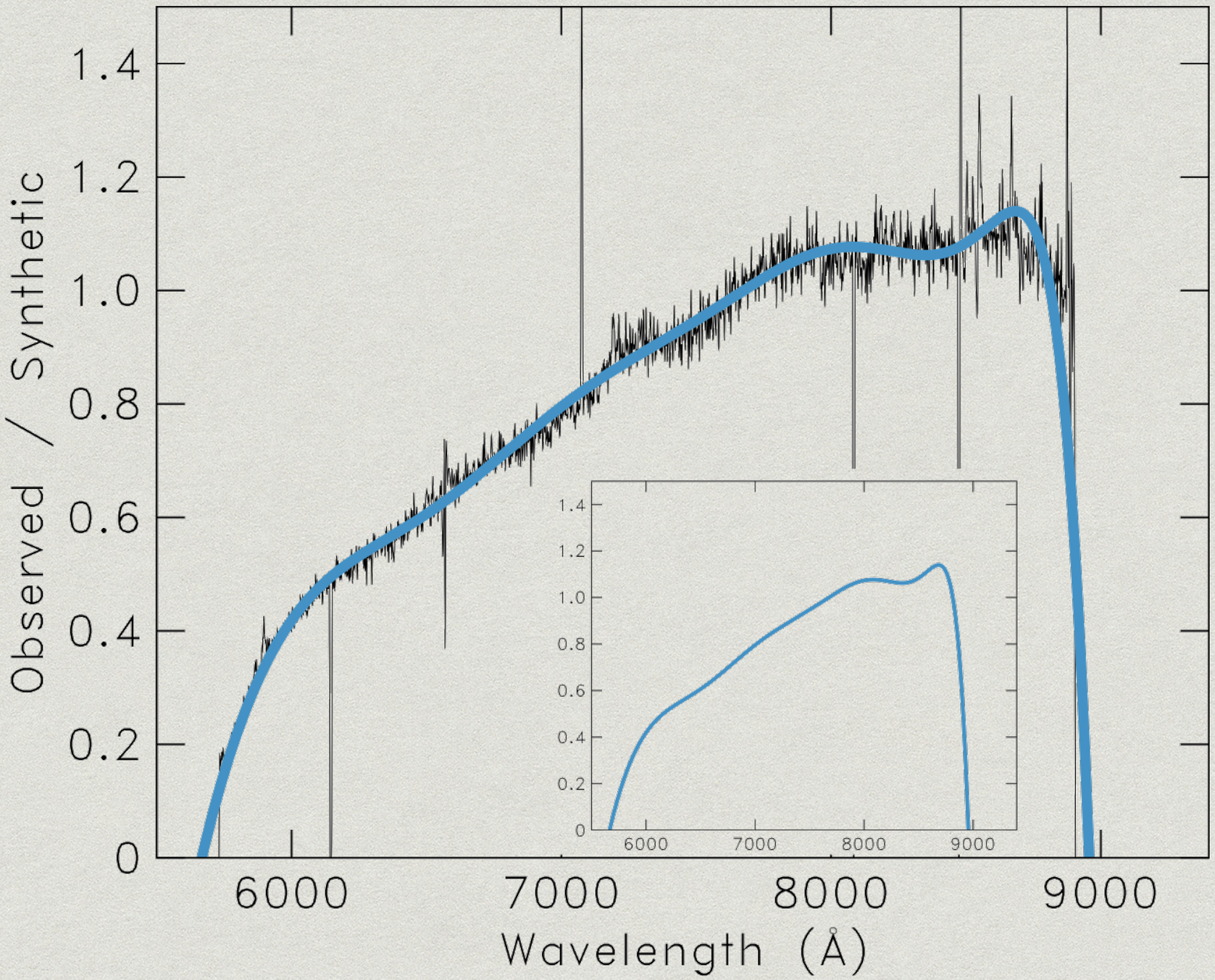
# SAVITZKY–GOLAY



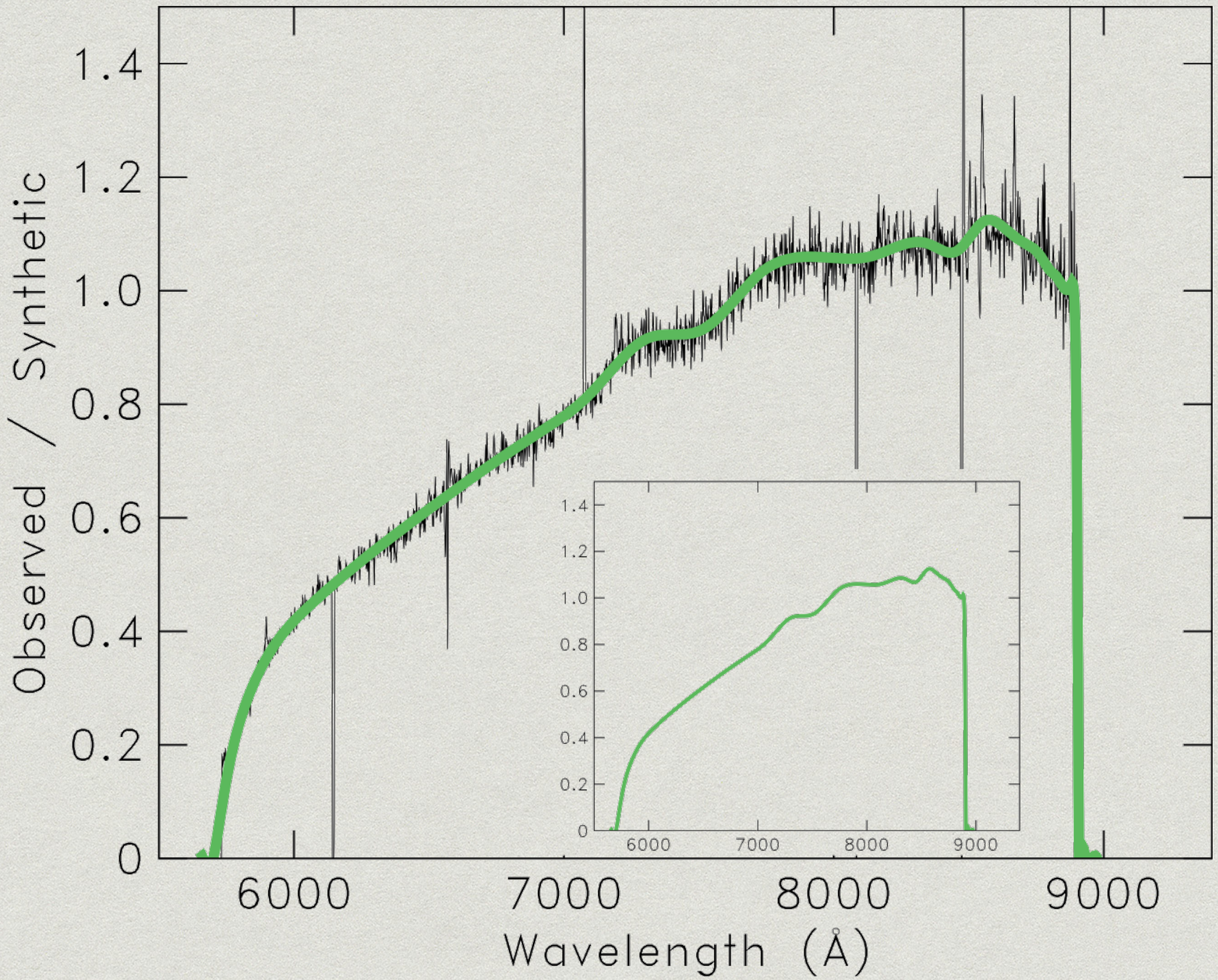
# GAUSSIAN


Observed / Synthetic
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
6000
7000
8000
9000
Wavelength (Å)

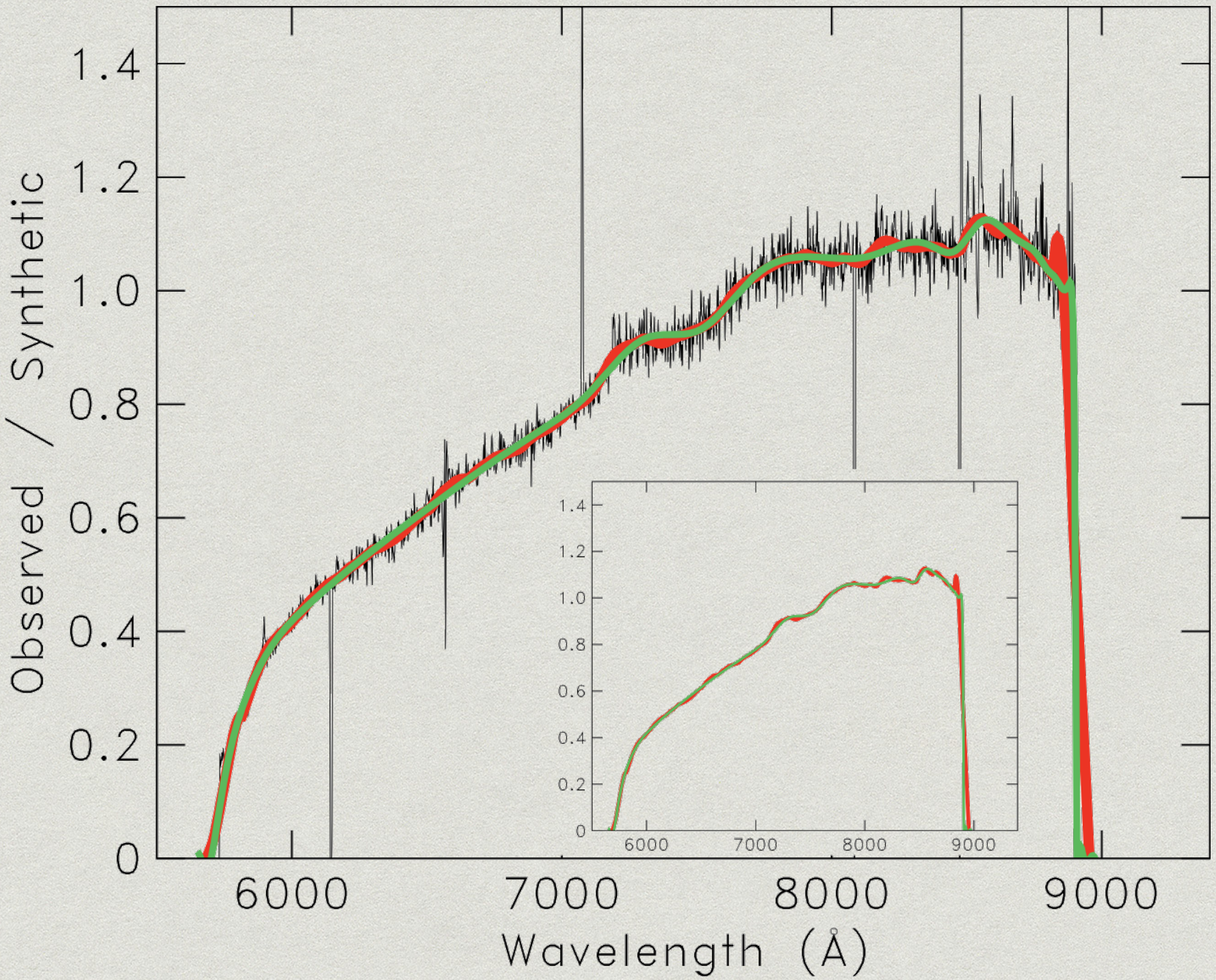
# POLYNOMIAL


Observed / Synthetic
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
6000
7000
8000
9000
Wavelength (Å)

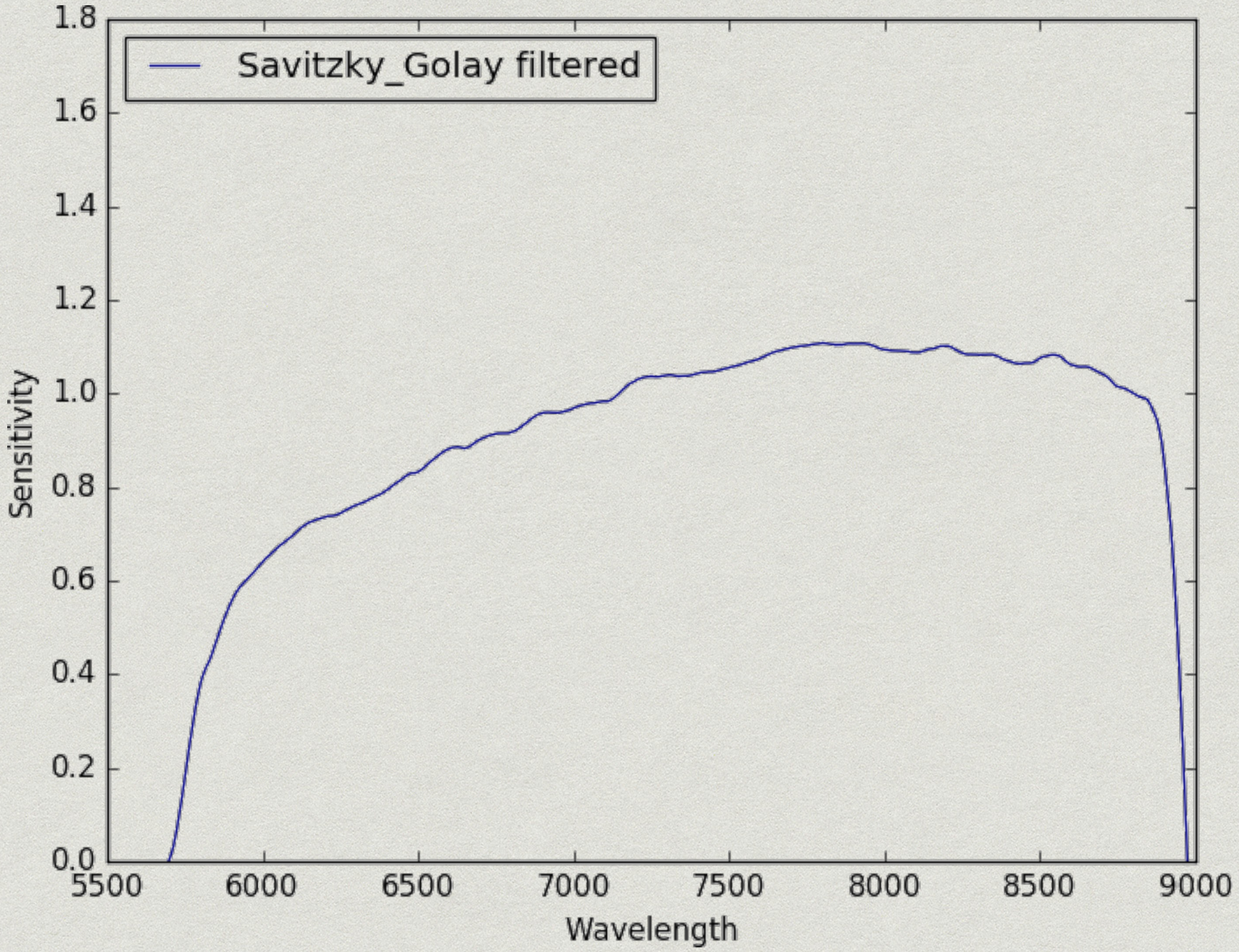
# SPLINE INTERPOLATION



# SAVITZKY–GOLAY vs. SPLINE INTERPOLATION



# SAVITZKY–GOLAY



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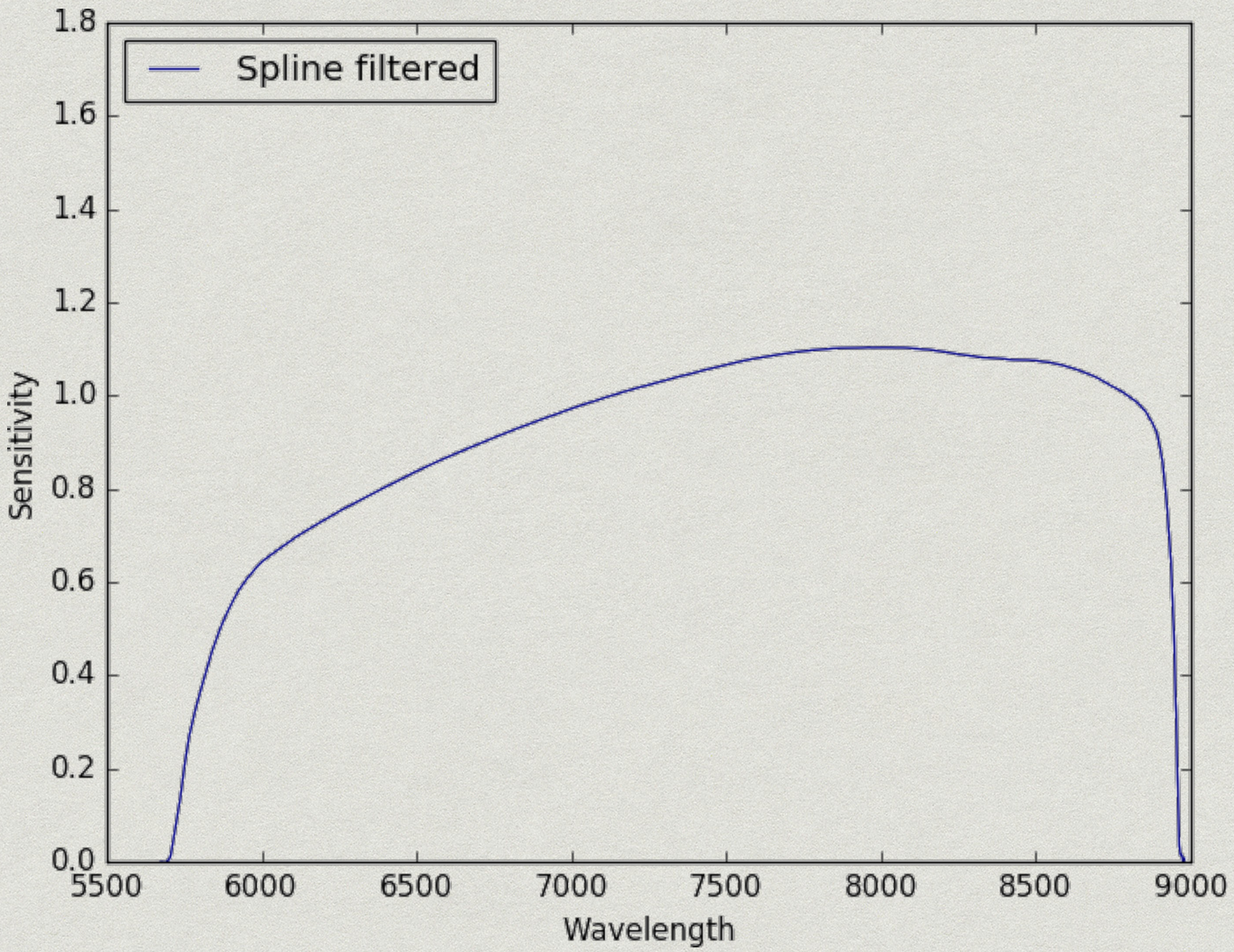

# GITHUB REPOSITORY

## https://github.com/mjcowley/TAIPAN-FluxCal