

# Exposure Time Calculator

- [Home](#)
- [Project Sites](#)
  - [BSCW](#)
  - [Confluence](#)
  - [JIRA](#)
- [Science Wiki](#)
- [General](#)
- [The Project](#)
- [Overview](#)
- [Science](#)
- [Instrument](#)
- [Timeline](#)
- [Code of Conduct](#)
- [News](#)
- [Team](#)
- [Consortium](#)
  - [Other](#)
  - [Other MOS](#)
- [Conferences and workshops](#)
  - [Meetings](#)
  - [Posters](#)
  - [Logo](#)
  - [Publications](#)



## Exposure Time Calculator (ETC)

- [Exposure Time Calculator \(ETC\)](#)
  - [Description](#)
  - [Download ETC](#)
  - [Documentation](#)
  - [Feedback](#)

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This page provides information about the WEAVE ETC.

### Description

This is the exposure time calculator (ETC) for WEAVE.

**The current Python 3.X version is v5.0, dated 6 January 2021.** Throughput values represent as-built estimates for most components (as of November 2020). Please test!

**The current Python 2.7 version is v4.2.4.1, dated 1 September 2020.** Note that the throughput values represent the best estimates as of February 2018 (to be updated ASAP!).

v4.2.4.1: Minor bug fix version – fixed typo in help string (thanks [Rubén García Benito](#)).

v4.2.4: The optional "-LIFU" switch has been added to correctly alter the resolution and fibre size. Note however that binning isn't (easily) available in this version, so the noise reflects unbinned observations.

v4.2.3: Seeing is handled more appropriately: now the seeing parameter reflects the actual seeing, which is then convolved with the typical PSF of the corrector assembly (unlike in previous versions, where the seeing was the achieved image diameter at the fibre).

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## Download ETC

[signalWEAVE.5.0.tar.gz](#)

[signalWEAVE.4.2.4.1.tar.gz](#)

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## Documentation

### Python 3.X version:

Download and unpack v5.X, then run

```
% ./signalWEAVE -h
```

to see how to run.

### Python 2.7 version:

Download and unpack v4.2.4.1 then run as

```
% ./signalWEAVE <optional switches> <magnitude or surface brightness> <exposure time in seconds>
```

Notation: <> represents a number required on input

If no exposure time is given, the ETC assumes a single 18 minute exposure.

#### Optional switches:

##### **Instrument Mode**

choose ONE of

-blueLR [default]

-redLR

-blueHR

-greenHR

-redHR

##### **Fibre mode** (optional)

-LIFU

##### **Object/observing conditions parameters**

-band <filter of magnitude or surface brightness> [default: V] (choices: UBVRI)

-X <airmass> [default: 1.2]

-sky <surface brightness of sky between the lines> [default: 22.7 mag/sq. arcsec in B band]

-skyband <band of interest for sky background> [default: B] (choices: UBVRI)

-profile <seeing profile> [default: Moffat] (choices: Gaussian or Moffat)

-betam <beta of Moffat profile> [default: 2.5] (only if profile is Moffat)

-FWHM <full width at half maximum of seeing disk> [default: 0.95]

-readnoise <RN in e-> [default: 2.5]

-dark <dark current in e-/hour> [default: 0.]

-offset <offset of fiber center from object center in arcseconds> [default: 0.1]

-sb (switch to set input as surface brightness in mag./sq. arcsec instead of point source magnitudes)

Return values should be self-explanatory.

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## Feedback

Note that the defaults now give a S/N that is approximately **twice** that of version 4.1.3.2, due to the fixed computation of the Moffat profile (Scott offers his deepest apologies for this mistake, but hey! twice the S/N!). Note that using the Gaussian profile instead gives comparable results.