APOETC

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Welcome to APOETC's documentation (Apache Point Observatory Exposure Time Calculator).

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ABOUT APOETC

This exposure time calculator is specifically designed for the Astrophysical Research Consortium (ARC) 3.5m telescope. It was motivated by an observational techniques class from the Astronomy Department at New Mexico State University. The program was entirely written by graduate students so that astronomers can easily determine how long they must expose in order to obtain their desired signal to noise ratio when observing with the ARC.

1.1 Documentation

1.1.1 The `arc` module

`Instrument`

class arc.**Instrument**(*inst_name*)

Bases: `object`

This object represents the instrument used.

Parameters **inst_name** (*str*) – This is the name of the instrument used.

filter(*bandpass*, *Johnson=True*, *SDSS=False*)

Method that returns the transmission of specified filter.

Parameters

- **bandpass** (*str*) – The bandpass of the filter used (i.e., 'U','B','V','R', or 'I').
- **Johnson** (*bool, optional*) – If true, then the bandpass is referring to the Johnson-Cousin filters. Defaults to True
- **SDSS** (*bool, optional*) – If true, then the bandpass is referring to the Johnson-Cousin filters. Defaults to False

Returns The transmission of the filter interpolated over the bandpass. Also sets a filter_range attribute (Angstroms).

Return type Interpolated object.

interpolate_efficiency()

Method that interpolates the quantum efficiency.

Returns The efficiency of the instrument interpolated over the appropriate wavelenghts (in Angstroms).

Telescope

class arc.**Telescope**(*obs_name='ARC 3.5m'*, *aperature=3.5*)
Bases: object

Object that represents the telescope used.

Parameters

- **obs_name** (*str, optional*) – The name of the observatory used, default to 'ARC 3.5m'.
- **aperature** (*float, optional*) – The diameter of the telescope used (in meters), default to 3.5.

1.1.2 The signal_to_noise module

Sky

class signal_to_noise.**Sky**(*lunar_phase=0*, *seeing=1*, *airmass=1*, *transmission=0.9*)
Bases: object

emission()

transmission()

Target

class signal_to_noise.**Target**(*magnitude*, *magsystem*, *filter_range*, *SED=None*, *temp=5778*)
Bases: object

Object representing the target star.

magnitude
float The magnitude of the star you wish to observe.

magnitude_system
str The magnitude used in the above attribute.

filter_range
tuple The band pass of the filter (xmin,xmax).

SED
obj If specified, this will contain the interpolated spectral energy distribution of the target star.

temp
float The temperature of the star. This is used only if you wish to use Plank's law to obtain the SED.

blackbody_lambda()
Calculates the spectrum of a blackbody from temperature temp.

Returns The wavelength flux of the target as determined by a blackbody

convert_to_flux()
Convert magnitude of target star to flux.

Returns The wavelength flux of the target in cgs units.

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