



# XMMextractor\_tools

January 27, 2025

## Abstract

The module XMMextractor\_tools, under the main package (pyutils) contains several utilities used by (XMMextractorpy), which can be used also in standalone situations, alongside the objects from (pyOAL).

## 1 Use

In order to use XMMextractor\_tools simply import it in a Python session:

```
import pysas.XMMextractor_tools.XMMextractor_tools as xmm_tools  
  
pyutils.(function)...
```

A further explanation of the different functions present in XMMextractor\_tools can be found in the section below. For a more detailed description on how to run each function, use the help(...) command.

## 2 Description

XMMextractor\_tools contains several functions used mainly by the XMMextractorpy package, although they can be used normally by any other Python package or environment, similar to (pyutils).

### 2.1 Current functions

At the moment, these are the current functions present in XMMextractor\_tools:

- *ODF\_times*: Searches in the SUM.SAS file the duration and times of the observation.
- *angular\_distance*: Returns in degrees the angular distance between two objectives.
- *add\_source\_to\_region\_file*: Creates a region file text that can be read with ds9.
- *produce\_ps\_file*: Produces a PS file.



- *deg\_to\_hours*: Transforms degrees to hours.
- *deg\_to\_sexagesimal*: Transform degrees into sexagesimal degrees.
- *event\_file\_spectral\_info*: returns information regarding the timing of the event file.
- *get\_back\_scale*: returns the backscale.
- *get\_area\_scale*: returns the areascale.
- *get\_entries*: Returns the number of entries loaded in the header of a FITS file.
- *print\_sas\_setup*: shows the information regarding the current SAS setup.
- *set\_coordinates*: set the coordinates for a given Observation object (from pyOAL).
- *produce\_image*: produces an image for EPIC.
- *produce\_image\_4GUI*: produce an image to be used for the GUI.
- *produce\_smooth\_image*: produces an smooth image.
- *GTI\_file\_info*: returns the ONTIME parameter for a GTI file.
- *get\_OM\_science\_modes*: returns a tuple of booleans representing the current science modes available for the observation.
- *get\_bkg\_region\_SP\_creation*: returns the background information for a region.
- *get\_src\_region\_SP\_creation*: returns the source information for a region.
- *get\_src\_region\_LC*: returns the source region information (for light curves)
- *event\_file\_info*: returns basic information concerning an event files.
- *get\_bkg\_region\_LC*: returns the background region information (for light curve)
- *prepare\_region\_log\_file*: Writes into a log file the information from a region.
- *build\_expression*: Writes a basic expression for either a source or background region.

## 2.2 Errors

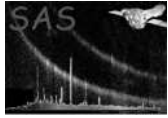
Will raise the usual Python exceptions through the AstroPy/NumPy frame. Other errors will be notified to the user accordingly in each function.

## 3 Input Files

1. Each function has its own arguments and inputs. Please use the help function to gather more information.

## 4 Output Files

1. Each utility has its own output files (or any). This is mentioned in the documentation for each function.



## 5 Comments

- Please report any bug found or any extra utilities that may seem useful in the context of the XMMextractor package.

## References