

MODARF - Python-Script for modification of XMM-Newton/EPIC and Chandra/ACIS effective areas according to the stack residual ratios in Schellenberger et al. 2014, arXiv:1404.7130.

If you publish results using this script, please cite the above work.

This work was supported by the IACHEC - <http://web.mit.edu/iachec/index.html>

Spline interpolation adopted from Press et al. 1992[3.3]

Scaling factors were computed with Chandra CALDB 4.5.5.1 and XMM calibration files from 14.12.2012 .

Requirements: python(2.x), astropy (pyfits), numpy

The arf modification is valid in the 0.5-7.0 keV band

Note that only the shape (i.e. energy dependence) of the effective area is correctly modified. The normalisation of the effective area is forced to remain unchanged at 1.1 keV during the arf modification. Thus, the tool is valid for studying the cross-calibration uncertainty effect on the temperatures, but not on fluxes.

Usage:

python modarf.py [input-arf] [outfile] [mode]

The script modifies the "input-arf", the effective area of an input instrument, assuming that the calibration of the shape of the effective area of the reference instrument (defined by "mode" parameter) is precise, and produces "outfile" containing the modified arf.

mode	input instrument	reference instrument
1	ACIS	PN
2	ACIS	MOS1
3	ACIS	MOS2
4	PN	ACIS
5	PN	MOS1
6	PN	MOS2
7	MOS1	ACIS
8	MOS1	PN
9	MOS1	MOS2
10	MOS2	ACIS
11	MOS2	PN
12	MOS2	MOS1