Pipeline Processing Information

The NICER L2 pipeline produces the files in the `xti/event_cl` directory, as follows

UFA file (`ni<obsid>_0mpu7_ufa.evt`)

- This file is generated by `nicercal`, which adds the `PI` and `PI_FAST` columns as well as applying the clock corrections.
- All MPUs merged into a single file.
- MPU GTIs are combined with "AND" logic, so whenever any MPU is dead, all are excluded
- Events are filtered according to "`(filtexpr = EVENT_FLAGS=bxxxx00)`", which removes all OVERSHOOT and UNDERSHOOT events, but leaves forced triggers and all photon events

CL file (`ni<obsid>_0mpu7_cl.evt`)

Events are filtered (using `nicerclean`) according to:

- `(pirange = 20:1500)` Energies from 0.2 to 15 keV
- `(trumpetfilt = YES)` Trumpet cut based on PI_RATIO is applied. Expression is: **`PI_RATIO < fastconst + (fastsig/10 eV)/PI + fastquart*PI**3`**
  - `(fastconst = 1.1)` Fast chain constant noise cut for PI_RATIO
  - `(fastsig = 1200.0)` Fast chain noise cut for PI_RATIO in eV
  - `(fastquart = 0)` Fast chain quartic gain error
- `(filtexpr = EVENT_FLAGS=bx1x000)` Remove all UNDERSHOOT, OVERSHOOT, and FORCED TRIGGER events. Also remove all FAST-ONLY events, so all events will have triggered the slow chain.

and GTIs are made (using `nimaketime`) according to these criteria:

- (nicersaafilt = YES) NICER SAA is excluded.
- (saafilt = NO) Generic SAA exclusion filter is not applied
- (trackfilt = YES) Exclude times of bad tracking
- (ang_dist = 0.015) Maximum angular distance from target (deg)
- (elv = 30) Minimum elevation above earth limb (deg)
- (br_earth = 40) Minimum elevation above bright earth limb (deg)
- (cor_range = *-*) No cut on cut-off rigidity
- (min_fpm = 38) Minimum number of enabled detectors