

## Filtering Parameters

GOAT uses filtering to remove clusters with low-quality base calls. The quality of a specific base call can be estimated using either the "purity" or the "chastity" of the base:

- ▶ Purity: the ratio of the brightest intensity over the sum of all four intensities
- ▶ Chastity: the ratio of the brightest intensity over the sum of the brightest and second brightest intensities

### Quality Filters

The overall quality of each cluster is estimated according to the quality of the base calls over a given number of cycles, by default 25, and can be any of these:

- ▶ failed-chastity: the number of bases where the chastity is lower than the given threshold
- ▶ chastity: the minimum chastity
- ▶ purity: the minimum purity
- ▶ By default, the pipeline filters the clusters according to the relation "failed-chastity<=1", using a chastity threshold of 0.6, on the first 25 cycles. This removes all clusters with a chastity less than 0.6 on two or more bases among the first 25 bases.

### Command Line Options

The filtering parameters can be modified on the goat command line (both goat\_pipeline.py and bustard.py). The relevant command line options are:

Option	Description
--smt-filter	The type of filter to use. Supported values are "failed-chastity", "chastity" and "purity".
--smt-relation	The type of relation to use. Supported values are "lt" (less than), "le" (less than or equal to), "eq" (equal), "ne" (not equal to), "ge" (greater than or equal to), and "gt" (greater than).
--smt-threshold	The numerical value of the filter threshold.
--chastity-threshold	The numerical value of the chastity threshold to use when filtering according to the "failed-chastity".
--pure-bases	The maximum number of cycles to use for filtering.

### Examples

The default filter is equivalent to:

```
--smt-filter failed-chastity --smt-relation le
--smt-threshold 1 --chastity-threshold 0.6
--pure-bases 25
```

To use the default filter formerly used in Pipeline v1.0 (CHASTITY>=0.6) on the first twelve bases:

```
--smt-filter chastity --smt-relation ge
--smt-threshold 0.6 --pure-bases 12
```