

Summary of Quality Assurance Process and Keywords

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As part of the Level 2 and 3 processing performed at the SOFIA Science Center (SSC), all processed data are checked for quality before archiving and distribution to guest investigators (GIs). The QA process includes:

- verification/correction of critical meta-data (FITS keywords);
- visual checks for anomalies due to observing conditions or other off-nominal conditions;
- and a consistency check in the flux calibration analysis.

Results of the QA process are conveyed in the DATAQUAL keyword for all processed data. In addition, the WCS quality for imaging observations, is documented in the WCSQUAL keyword.

DATAQUAL: Indicates overall data quality; indicator of scientific reliability for the dataset.

Values are:

NOMINAL: no outstanding issues with processing/calibration/observing conditions.

USABLE: minor issue(s) with processing/calibration/conditions but should still be scientifically valid (perhaps with larger than usual uncertainties); see HISTORY records for details.

PROBLEM: significant issue(s) encountered with processing, calibration, or observing conditions; may not be scientifically useful (depending on application); see HISTORY records for details. In general, these cases are addressed through manual re-processing before archiving and distribution.

FAIL: data could not be processed successfully for some reason. These cases are rare and generally not archived or distributed to the GI.

WCSQUAL: Indicates quality of WCS reference position. Assessed by comparing the derived reference position (from the instrument boresight) to the requested coordinates (OBSRA/OBSDEC). Values are:

NOMINAL: No issues; reference position *appears* to be accurate to within approximately one pixel of the requested coordinates.

PROBLEM: The WCS reference position deviates from the requested coordinates by more than 1 pixel. This may be because the target was placed in a different part of the array or that one (or more) of the chop/nod cycles failed. Relative positions on the array will be accurate to a fraction of a pixel, but absolute positions are suspect.

UNKNOWN: For some reason it was impossible to verify the WCS reference position independently. Usually this is because the requested coordinates are unknown.