

KAZR-ARSCL Evaluation Product

Known Issues and Planned Enhancements

Last Updated 2012.11.01

Known Issues

1. Neither SGP nor GAN KAZR Reflectivities have been calibrated

The KAZR data used to create the KAZR-ARSCL evaluation product has not yet been calibrated. Initial multi-radar comparisons suggest that SGP KAZR reflectivities for the evaluation period may be biased low by 10 dB, or possibly more (relative to the SACRs, and the UAZR). In addition, there appears to be a 1 to 2 dB offset in calibration between the two operating modes the KAZR is running.

2. GAN clutter removal is overly aggressive.

Some hydrometeors below 435 m are removed when they should not be.

3. Cloud fraction, Cloud Boundary fraction discontinuities

At GAN, and potentially at SGP, height profiles of cloud fractions computed using the 'reflectivity_best_estimate' field have a small, but noticeable, discontinuity at the level where the two KAZR operating modes are merged. This discontinuity may be due, at least in part, to the small calibration offset between the two radar modes (see Item 1, above). At GAN, the mode merge occurs at approximately 2 km. At SGP, modes are merged at approximately 2 km (early in the evaluation period, when the CI mode was used) or at approximately 700 m (when the BL mode was used, from 2011.05.05 onward)

There are small, but noticeable, cloud boundary frequency discontinuities at 3 km. This is the level above which KAZR-ARSCL incorporates MPL cloud masks into the overall hydrometeor mask for cloud base and cloud top determination,. Below 3 km, KAZR-ARSCL does uses KAZR cloud masks only due to a tendency of the MPL cloud mask (from the 30smplcmask1zwang data stream) to smear low level thin cloud layers into a single cloud entity. We will rework our cloud base, cloud top algorithm to correct the anomaly at 3 km.

4. cloud_base_best_estimate field:

There is an error in the (uncommon) case where MPL data is missing and the Vaisala ceilometer reports obscuration, but no cloud is detected. This case would currently be assigned a 'cloud_base_best_estimate' value of -1 (clear). However, this should have been assigned a value of -2 (Possible clear sky). Note that this case does not occur often, if at all, in these data sets.

5. 'missing_value' data type errors:

'missing_value' and a few other field attributes: of various data fields are stored as strings when they should be stored as floating point or integer fields. This may cause problems in reading the data using recent versions of the Python netCDF4 library.

Planned Improvements (in addition to the correction of Known Issues)

1. The 'precip_flag' (0 / 1) will be replaced by actual KAZR-ARSCL-gridded precipitation.
2. An ARSCL-gridded MPL cloud mask field will be added to the output.