

### Introduction

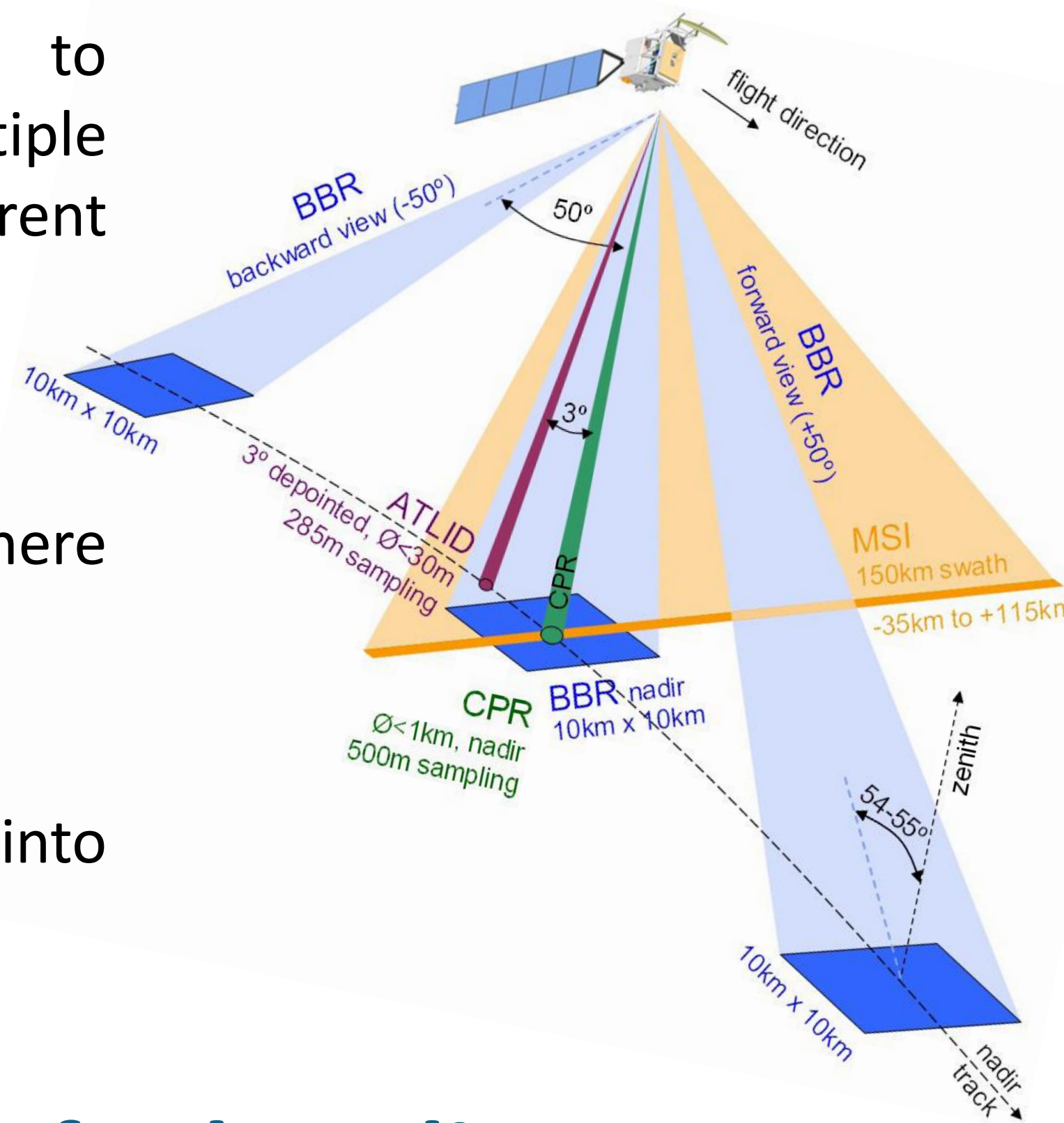
Since the EarthCARE launch in May 2024, the Broad-Band Radiometer BBR measures **SW** (0.2 - 4 $\mu$ m) and **TW** (0.2 - >50 $\mu$ m) radiances at three fixed viewing zenith angles in an along track configuration (fore, nadir, aft). The signal provided by the BBR is a radiance filtered by the spectral response of the instrument, which is corrected in the unfiltering process, in the **BM-RAD** processor, in order to reduce the effect of a limited and non-uniform spectral response. In the **BMA-FLX** processor a radiance-to-flux conversion algorithm based on Angular Distribution Models (ADMs) is used to convert the unfiltered BBR radiances into radiative fluxes at the TOA.

### MULTI-VIEWING CAPABILITY

The BBR's multi-viewing capability is key to capturing the Earth's radiation field from multiple angles, observing every target from three different views.

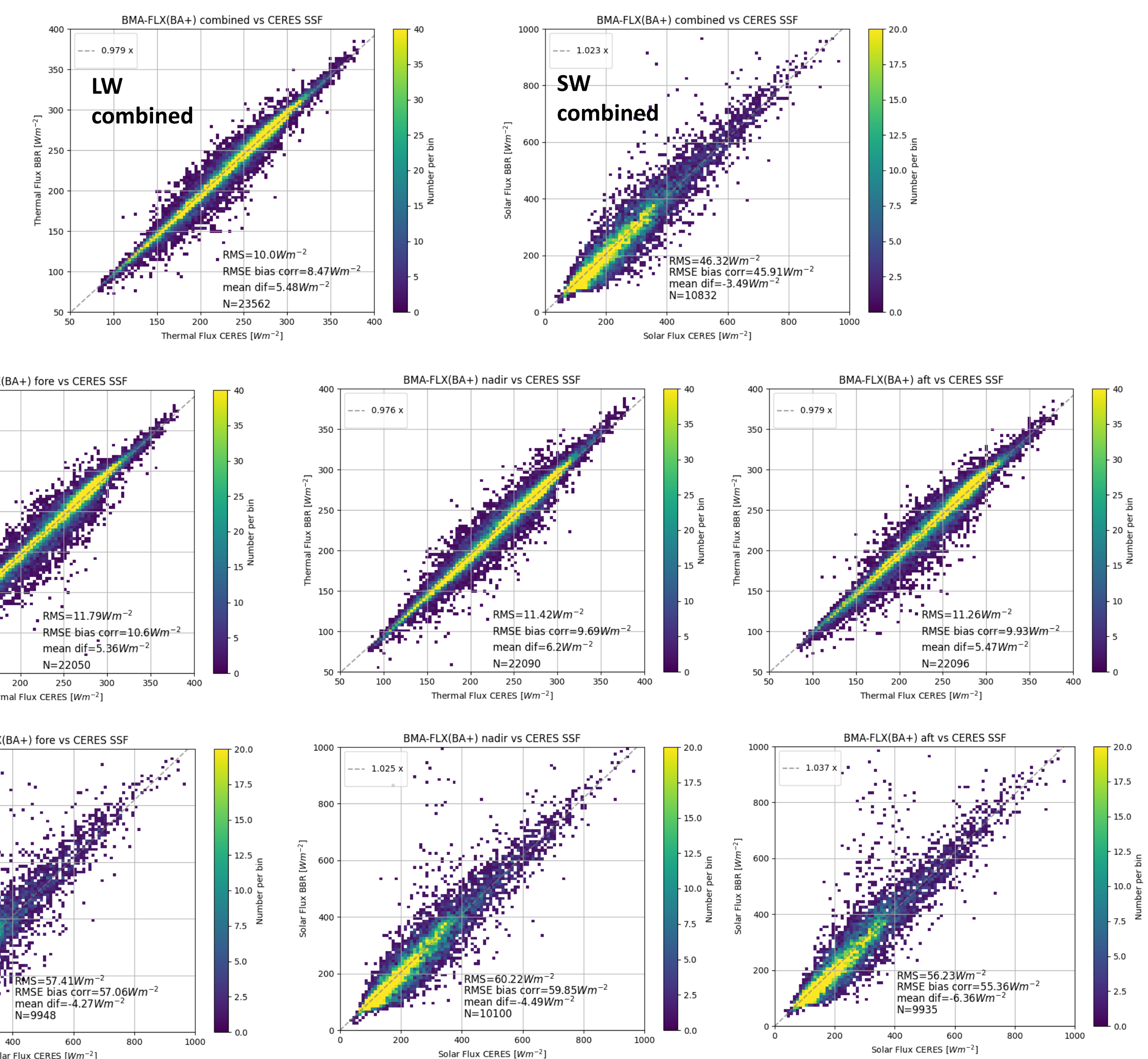
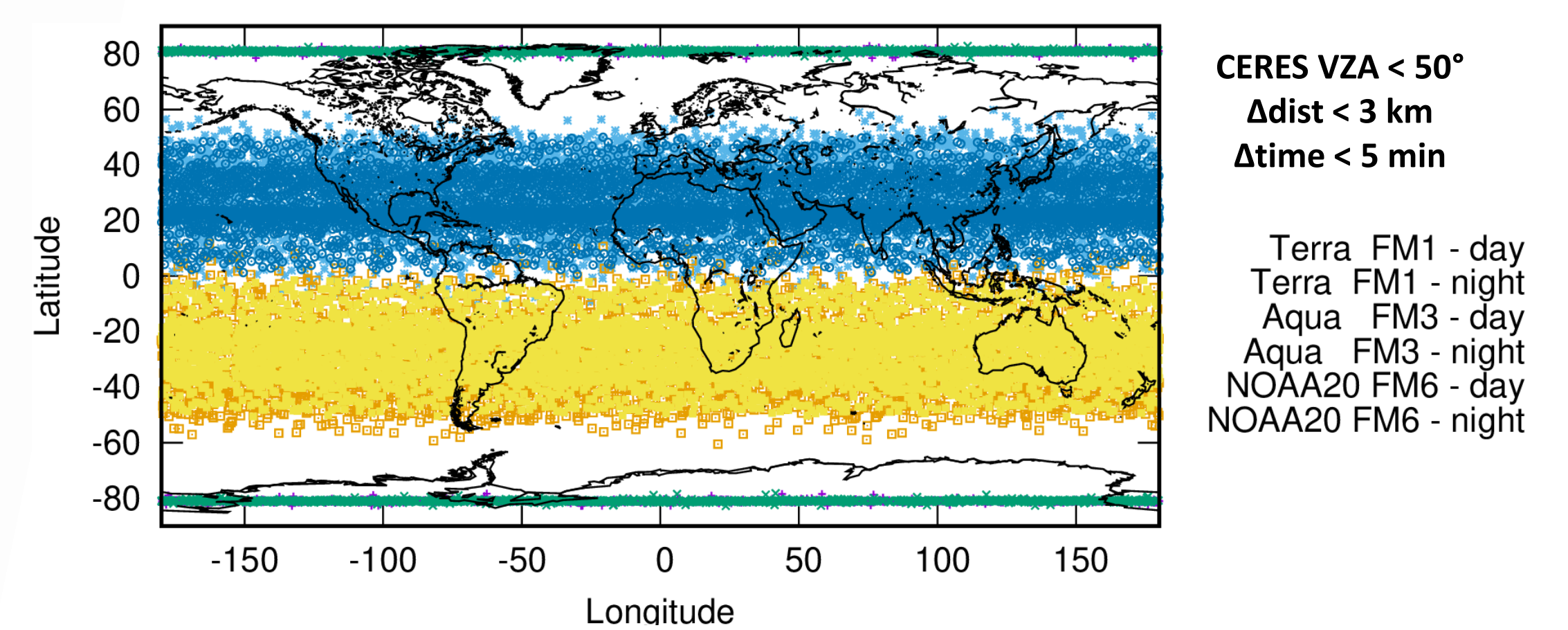
The retrieval algorithm exploits it by:

- co-registering the radiances to the height where reflection or emission takes place,
- providing flux estimates for every view and
- checking their integrity before combination into the TOA flux best-estimate.



### CERES COMPARISONS

BMA-FLX BA+ and CERES SSF Fluxes comparisons from August 2024 till January 2026



### BM-RAD/BMA-FLX – updates for baseline CA

- Use a minimum number of pixels to perform a MSI PSF-weighted average
- Use invalid quality status flag from L1 (B-NOM and B-SNG) to flag invalid data
- Redefinition of both solar and thermal quality status for the combined flux:
  - 0: Very high confidence → High confidence
  - 1: High confidence → Medium confidence
  - 2: Confidence → Low confidence
  - 3: No confidence
- Quality status of solar combined fluxes switched from 2 to 3 when only one flux is valid (only one flux available for the combined flux)
- Improvement of the solar flux combination algorithm when two/three valid fluxes strongly disagree → the flux selection is based on anisotropic factors instead of flux errors.
- Inclusion of thermal flux errors
- Improved calculation of solar flux errors
- Inclusion of missing quality status for thermal co-registered radiances and fluxes

### NEW VARIABLES – baseline CA

BM-RAD	
	<ul style="list-style-type: none"> <li><code>cloud_cover_confidence</code> (along_track, bbr_view) from MSI</li> </ul>
BMA-FLX	
	<ul style="list-style-type: none"> <li><code>cloud_cover_confidence</code> (along_track) from BM-RAD/MSI</li> <li><code>total_column_water_vapour</code> (along_track) from X-MET</li> <li><code>MSI_cloud_optical_properties_confidence</code> (along_track) from MSI</li> <li><code>zero/one_weight_edge_latitude</code> (along_track, corners) from BM-RAD</li> <li><code>zero/one_weight_edge_longitude</code> (along_track, corners) from BM-RAD</li> </ul>

See also:

- S113: EarthCARE BBR Operations and L1/L2 Product Performances – N. Clerbaux
- T317: Towards Radiative Closure in EarthCARE: Evaluation of TOA Flux Retrievals – C. Salas
- T318: BBR Level-2 Validation Efforts within the BRAVO Project – C. Aebi

