BBR summary and discussion

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1st ESA-JAXA EarthCARE In-Orbit Validation Workshop
14 – 17 January 2025 | VIRTUAL EVENT

BBR session – Tue., 14 January 2025

BBR session (Co-chairs: Jason Cole, Nicolas Clerbaux, Kentaroh Suzuki)					
14:15	22:15	8:15	10	BBR Integrated Commissioning Team presentation	Emilio Alvarez
14:25	22:25	8:25	15	BBR Level 1 product verification	Nicolas Clerbaux
14:40	22:40	8:40	10	BBR Geolocation	Edward Baudrez
14:50	22:50	8:50	10	EarthCARE BBR Level 1 Products Assessment within BRAVO project	Christine Aebi
15:00	23:00	9:00	10	BBR Level 2 verification results	Almudena Velazquez
15:10	23:10	9:10	15	Early validation of JAXA four-sensor radiation product	Takashi M. Nagao
15:25	23:25	9:25	10	CERES and EarthCARE Intercomparison Opportunities	Alexander Jarnot
15:35	23:35	9:35	15	Discussion	(Co-chairs)

BBR session – Summary of the talks 1/2

Emilio Alvarez reported about the In-Orbit commissioning of the BBR. In general, everything ran smoothly, and the instrument is performing as expected. All commissioning requirements were fulfilled.

Nicolas Clerbaux reported on overall good quality of the B-SNG product. Some possible improvements in the L1 software and CCDB have been identified (that the 'B' values). Preliminary comparison with CERES FLASHflux shows that the SW (LW) radiances might be biased high (low) with respect to CERES.

Edward Baudrez : reported about the overall good quality of the BBR geolocation (well within the 1km requirement) although some instabilities have been observed in (very limited) areas.

Christine Aebi : reported on the quality of the B-NOM product. She showed that the radiometric levels of the aft and fore views agree quite closely. The analysis also shows consistency between the different integration domains (except for the "full" domain due to the dead pixel).

BBR session – Summary of the talks 2/2

Almudena Velazquez Blazquez : showed preliminary assessment of the BBR L2 products (BM-RAD, BMA-FLX) with focus on the fluxes. She showed that the co-registration of the 3 views at the SW/LW reference level is in general working well. Flux comparison with CERES FLASHflux is in line with the radiance comparisons (i.e. brighter in SW, cooler in LW). In addition, the BMA-FLX product is compared with fluxes from ACM-RT, showing sometimes large discrepancies that are under investigation.

Takashi M. Nagao : reported on the development of the JAXA synergy radiation product (ALL-RAD) and on the early validation results using the BMA_FLX product. ALL_RAD and BMA_FLX exhibit low bias on a global average but strongly depends on land/water and day/night conditions, and the bias of SW flux is amplified when covered by clouds.

Alexander Jarnot : detailed how the CERES FM6 instrument could be operated in special scanning mode to optimize angular matching with the 3 BBR views. He also reported that the FLASHflux product quality should be close to the CERES edition products.

Stelios Kazadzis : summarized plans for participation in validation campaigns in Greece for radiative closure, which will validate aerosol and cloud optical thickness and perform radiative closure using solar irradiance measurements and radiative transfer calculations.

Questions and Discussion : There was little time for questions and discussion during the BBR session.

Seed questions for discussion 1/2

Question 1 : What has been identified by validation team as aspects to improve and are there clear/proposed way to address that?

- Edward Baudrez : possibility to improve the B-SNG geolocation
- Biases : need to improve but way forward not yet clear
- …

Question 2 : What are the positive aspects about the data, processors that can be highlighted from validation team results?

- Excellent data availability
- Very stable instrument, no anomalies
- Detector noise level better than requirements → BBR could be useful at finer spatial resolution than 10x10km.
- ...

Question 3 : What are aspects that are yet to be validated?

- Nobody reported about the Solar Calibration (each 2 months) so far.
- fore and aft view radiometric level (CERES?)
- …

Seed questions for discussion 2/2

Question 4 : What should be noted to public about the quality of the released L1 data?

- Provide more comprehensive information on how to interpret the BBR filtered radiances in B-SNG and B-NOM.
- ...

Question 5 : What recommendations/suggestions for future L1 / L2 validation activities (e.g. needs/gaps) and for mission planning?

- Compare the aft and fore views with CERES. Need of specific acquisition campaigns to match these views.
- Compare the computed surface flux with ground-based measurements (e.g. BSRN)
- ...