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Problem of gaps in X-centroid in the L1 data of UVIT

The UVIT-Payload Operations Centre (UVIT-POC) has recently come across (in June 2021) the presence of gaps in the X-centroids and shifts of 3 pixels (~10") in the L1 data of UVIT. They are noticed for some orbits of a pointing. However, such gaps are not seen in the data of all OBSIDs. The presence of such gaps will lead to split images (separated by ~10") and shifted positions (by ~10") of sources in part of the field in the L2 images. This was found during visual examination of L2 images carried out as part of the quality checks done by the POC. It appears that ~20% of OBSIDs have this issue, and of those 20% of the OBSIDs, ~10%% of the orbits are affected. At the moment, the UVIT-POC suggests caution that this problem could be in any pointing during the whole history of observations, and individual PIs may like to look for it in their L1 data. Please contact C. S. Stalin (stalin@iiap.res.in) at the POC for help to look for this defect.

After June 2021, in data sets where this issue is noticed, the POC has adopted the following approach (i) identify the orbit with centroid gaps, (ii) if gaps are found, remove that particular orbit (hereinafter bad orbit), (iii) create new merged L1 without the bad orbits and (iv) run L2 on the new L1 and post the data back to ISSDC. This approach will lead to loss of L1 data, and thus creation of L2 images with less exposure time compared to the actual observations carried out. Those OBIDs affected by this problem, among others, will have the following statement in the DISCLAIMER.txt file which is part of the L2 bundle.

"The data acquired at some orbits of the observation has gaps in X-centroids. In the L1 & L2 data downloadable from ISSDC, those orbit data will be missing. In effect, this has led to xx% of loss in the acquired data."

The xx% is calculated as follows,

xx% = (UV_L1 - UV_L1_mod) * 100 / UV_L1

where,
UV_L1 = original L1 file
UV_L1_mod = modified L1 file after removing corrupt data