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ORIGINAL ARTICLE

PACS photometer calibration block analysis

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Abstract The absolute stability of the PACS bolometer response over the entire mission lifetime without applying any corrections is about 0.5 % (standard deviation) or about 8 % peak-to-peak. This fantastic stability allows us to calibrate all scientific measurements by a fixed and time-independent response file, without using any information from the PACS internal calibration sources. However, the analysis of calibration block observations revealed clear correlations of the internal source signals with the evaporator temperature and a signal drift during the first half hour after the cooler recycling. These effects are small, but can be seen in repeated measurements of standard stars. From our analysis we established corrections for both effects which push the stability of the PACS bolometer response to about 0.2 % (stdev) or 2 % in the blue, 3 % in the green and 5 % in the red channel (peak-to-peak). After both corrections we still see a correlation of the signals with PACS FPU temperatures, possibly caused by parasitic heat influences via the Kevlar wires which connect the bolometers with the PACS Focal Plane Unit. No aging effect or degradation of the photometric system during the mission lifetime has been found.

Keywords PACS bolometers · Calibration block observations · Long term behaviour of bolometers

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