Accurate Fitting of Noisy Irregular Beam Data for the Planck Space Telescope

Accurate fitting of the noisy irregular amplitude only main beam data is essential for the retrieval of the Planck space telescope geometry [1]. Therefore, a novel two-step fitting algorithm which focuses on the spatial dependency of the in-flight measurements has been implemented. To reduce both the noise and the size of the dataset a spatial filter is applied, without reducing the amount of pattern information. Thereafter, a Kriging [2], [3] fitting is performed, providing a smooth model with a significant noise level reduction. As a result, this algorithm provides a much more accurate and smoother result, reasonable error estimates and runtimes several orders of magnitudes faster than the previous algorithms.

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