Focusing and MTF Compensation for KOMPSAT-3 Calibration and Validation

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**Abstract**

One of three big Cal/Val items in KOMPSAT-3 Cal/Val Phase I is the focusing to get the optimal MTF. For the focusing, KOMPSAT-3 has imaged the star, the night lamp and the edge target. Since the star imaging for the focusing is higher reliability than the others, we have gotten the optimal focusing value from the star image data, and additionally a little aberration has been found out from them.

MTF Compensation (MTFC) of the KOMPSAT-3 image data has been done in KOMPSAT-3 Cal/Val Phase II. For the MTFC of KOMPSAT-3, the PSF of KOMPSAT-3 has been generated from the star image data taken by KOMPSAT-3, and then the image data could be applied by Wiener filter with the PSF of KOMPSAT-3. The MTFC image data of KOMPSAT-3 has been validated and complied with the quality requirement of it.

**Spatial Cal/Val Step for KOMPSAT-3**

- FMC Temp: -0.18
- Pitch/Roll: -30 / -5 deg
- 2012.07.08, PAN_5, TDI 64

Main parameter for Along MTF: Line rate (Line time)

- Along MTF (Dynamic MTF): 2~4% (TDI 64)
- Across MTF (Static MTF): > 8% (TDI 64)

**Focusing with Star imaging**

FMC Temp from Star imaging (with only Across): '-0.2'

Any difference of the result may be between Along and Across.

- Final FMC temp is '0'.

Summary

- Optimal Focusing Cal/Val for KOMPSAT-3
- Final FMC temp is '0'.
- Updated Algorithm for Calculating the optimal Line rate value
- Best optimal PSF of K3 from Star imaging
- A little aberration in Star image.
- Optional image data Quality for KOMPSAT-3

**Preparation and Step for Focusing**

**Initial MTF before Focusing**

- Across MTF (Static MTF): > 8% (TDI 64)
- Along MTF (Dynamic MTF): 2~4% (TDI 64)
- Main parameter for Along MTF: Line rate (Line time)

- 2012.07.27, PAN_5, TDI 64
- Pitch/Roll: -30 / 5 deg
- FMC Temp: -0.18
- Old Line rate: 7243

- 2012.07.27, PAN_3, TDI 64
- Pitch/Roll: +30 / -1 deg
- FMC Temp: 0.0
- New Line rate: 6794

< With New Line rate >

- Across MTF (Static MTF): 8~10% (TDI 64)
- Along MTF (Dynamic MTF): 6~8% (TDI 64)

**MTF Compensation**

- Wiener filter with 7x7 kernel

**Summary**

- The KOMPSAT-3 image data with MTFC may have been compiled and acceptable by Users.