We estimated systematic rotation error matrix usin “mc_motor” dataset acquired in June 2016 and “cassis_pointing” dataset acquired in April 2016. We test the estimated systematic rotation error on “commissioning_2” dataset acquired in April 2016.

The systematic rotation error matrix $R_{err}(\alpha)$ should be estimated for every rotation angle α of CaSSIS camera with small angular step of 5-10 degrees. When we know the systematic rotation error matrix we can compute corrected rotation matrix $R'_{\text{fromJ2000toFSA}}$ from non-corrected rotation matrix $R_{\text{fromJ2000toFSA}}$ as $R'_{\text{fromJ2000toFSA}} = R_{err}(\alpha) * R_{\text{fromJ2000toFSA}}$. For the intermediate angles the systematic rotation error can be interpolated using linear quaternion interpolation (slerp). Since we had limited rotation data we experimented with two angles : 180 and 360 degrees.

Results:

1. Before the pointing correction average projection error is 263.3 pix, and the after pointing correction 22.5 pix.
2. Correction angle is about 0.235 degree for 180 degree CaSSIS rotation and about 0.242 degree for 360 degree CaSSIS rotation.
3. With single systematic rotation error matrix $R_{err}(\alpha) = R_{err}$ we get average error of 197 pix whereas with angle-dependent systematic rotation error matrix we get much smaller error of 22.5 pix.

Conclusion:

For best performance we should make angle dependent calibration. For that we need to acquire more data.