

## ***Interactive comment on “Dissecting effects of orbital drift of polar-orbiting satellites on accuracy and trends of cloud fractional cover climate data records” by Jędrzej S. Bojanowski and Jan P. Musiał***

### **Anonymous Referee #1**

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This manuscript addresses the issue that under-sampling and satellite drift makes it difficult to use NPOES satellites in the early record for cloud climate applications. This is an issue that has been pretty well established in previous studies. The main contribution here is the quantification of this error for each satellite and orbit.

The authors mention previous studies that introduced statistical methods of reducing bias due to satellite-drift. I am wondering why the authors did not test these methods in their analysis. Was it out of the scope of this study?

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#### Specific comments:

Line 35: Reference? Line 49: Attitude should be altitude Line 133: Should “full” be changed to “all”?

Lines 136-138: I understand the reasons given for using the spline model instead of the COMET CFC MMDC for the reference data. However, I think some comparison of the spline model to the COMET CFC MMDC should be included to understand the difference choosing this method makes. Also the line: “Firstly, the COMET time series does not cover years 1982–1990 included in the CLARA-A2 time series, and thus there was a need to substitute these years with the mean climatological diurnal cycles.” Does this mean the referential dataset was calculated differently before 1990 than after 1990? If this is the case then the impact should probably be discussed.

Line 234: I think Figure 17 (panel A) shows one of the more interesting results of this study. The author’s mention inhomogeneity as the reason for the sudden drop, but this is not overly descriptive and a little more discussion would be appreciated. Is the introduction of NOAA-17 (and later the MetOps) at a new sampling time the reason for this sudden shift? Would this figure change substantially if the Metops were left out as they were for other parts of the analysis?

#### Formatting comment:

The Figures in the manuscript eventually ended up being several pages ahead of where they were first referenced (e.g. Figure 17 is located on page 18 but referenced on page 11). I found myself constantly moving through the document to look at Figures. I wonder if the spacing of the figures could be adjusted?

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