Interactive comment on "Analysis of GPS radio occultation data from the FORMOSAT-3/COSMIC and Metop/GRAS missions at CDAAC" *by* W. Schreiner et al.

Anonymous Referee #1

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The study analyses the precision of GPS RO bending angles for different satellites and instruments. Six months of data from the F3C and Metop/GRAS missions are processed using the same software (CDAAC). Bending angle differences from climatology and differences between collocated profiles are analyzed. The study shows the high degree of mission independence of the GPS RO data at high altitudes. In particular interesting are the results in the lower troposphere. Differences between F3C and Metop/GRAS bending angles are related to different signal tracking depths. The GRAS receiver tracks signals at 1 kHz in RS mode (similar to IGOR OL mode). Different down-samplings suggest the use of 100 Hz sampling in the lower troposphere in future RO receivers. The paper is well written, and I recommend publication. I only

have some small (minor) comments.

The comments follow (page & line number).

p.2439,l.19: "... wildly fluctuating RO signals..." Maybe a different word than 'wildly' would be better here.

p.2441,l.20: "The calculation of bending angles performed by the CDAAC software is quite complicated and is outlined in Kuo et al. (2004) in part related to the use of PLL data." I can imagine that the derivation of bending angles is 'quite complicated'. However, I suggest to write "The calculation of bending angles performed by the CDAAC software is outlined in Kuo et al. (2004) in part related to the use of PLL data".

p.2442,l.6: "Next, raw L1 and L2 excess phases are smoothed with a 3-pass Savitzky-Golay filter with 0.5 s window for L1, and a larger window for both L1 and L2." I do not understand this sentence. What is the size of the 'larger window'? If I understand correctly '3-pass' means 3 times? What is the degree of the polynomial regression?

p.2443,l.12: "Finally, WO and GO derived bending angles are connected in one profile at the transition height determined individually for each occultation based on fluctuation of L2 signal (this height is constrained to be below 20 km)." What is the criteria for the fluctuation of the L2 signal?

p.2449,l.20: "When the amplitude inside..."

p.2449,l.28: "...when the true bending angle..."

p.2451,l.8: "Figure 13 shows a histogram of STDV for 308 000 globally distributed F3C profiles with outliers removed (i.e. STDV<10 μrad). The distribution shows an interesting bimodal signature and has a mean value of 1.78 μrad. Figure 14 shows a histogram of STDV for 79 000 Metop/GRAS profiles with a unimodal distribution having a much lower mean of 1.13 μrad." This sounds like you remove potential F3C outliers but not potential Metop/GRAS outliers. I suspect that you apply the same criteria (STDV>10 μrad) for both. At this point another number would be interesting:

the fractional number of successfully processed occultations for F3C and Metop/GRAS.

p.2452,l.4: "...von Engeln et al. (2010)..."

p.2452,l.23: Same as comment p.2451,l.8.

p.2453,l.26: "Figure 19 shows..."

p.2456,l.27: Figure 22 and Figure 23 are the same.

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