

## ***Interactive comment on “A Decade of GOSAT Proxy Satellite CH<sub>4</sub> Observations” by Robert J. Parker et al.***

**Anonymous Referee #3**

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<General Comments> Annual growth-rate of atmospheric methane-concentration is not constant. There are various sources, of which emission amount have large uncertainties. Long term and global data of proxy CH<sub>4</sub> concentration measured with a single space-borne instrument are valuable. The dataset is well validated with TCCON and models and its application such as flux estimation is well described. I recommend publication after minor modification.

<Specific Comments> (1) Page 3, Line 15, “This version (ver9)” Are the full-physics and proxy algorithms updated simultaneously? Brief explanation of version up history and its improvements will help readers’ understanding.

(2) Page 4, Line 12, “Switch to the secondary pointing mechanism” GOSAT sampling pattern has changed since January 2015 when the unstable primary pointing mech-

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anism has been changed. The secondary mechanism has much better performance of settling down. Both pointing fluctuation and bias had been removed. It also has wider pointing range in the along track direction. Therefore, more target observations for large emission sources have been allocated instead of grid observation with the nominal 3-point cross-track scan mode. Over the ocean, latitudinal range of glint observation has been widened. For 11-year GOSAT operation, this is the largest event that had affected the performance. Addition of description will be helpful to understand the description on Figure 4 in page 10.

(3) Page 8, Line 21, “sounding specific a priori information” and Page 9, Line 15, “Spectral dispersion” Do authors retrieve wavelength every time by fitting GOSAT spectral to the simulation spectra?

<Technical Corrections> (1) pages 28-32, references A few discussion papers of AMTD and ACPD are referred. They seem to be reviewed and published as AMT and ACP papers.

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