Dr. Dong,

Thank you for reviewing the paper. Please see our response below.

General Comments:

Su et al. (2015) described the methodology used to develop the next-generation CERES ADMs, which were developed using the latest cloud algorithms (Minnis et al., 2010). These newly developed ADMs are used to produce the Edition 4 Single Satellite Footprint TOA/Surface Fluxes and Clouds (SSF) product for Terra and Aqua and Edition 1 SSF product for Suomi NPP, whereas fluxes in the Edition 2 and 3 SSF products are inverted using the ADMs described in Loeb et al. (2005). This paper validates the TOA SW and LW fluxes inverted using the ADMs developed by Su et al. (2015), and provides the uncertainties and biases of instantaneous TOA fluxes. ADMs are an important means to convert the radiance to irradiance which plays an important role in Earth Radiation budget. As shown in Table 1, the biases of TOA SW flux using the new ADMs are decreased significantly from original ones those were based on old version ADMs (Loeb et al. 2005). Also the Estimated uncertainty in all-sky solar reflected single field-of-view instantaneous radiative fluxes at TOA is also decreased to 9.9 Wm^{-2} from original 13 Wm^{-2} (*Chambers et al.,* 2002; *Loeb et al*., 2003a, 2003b). These improvements are very important for researchers to study the global radiation budgets, and are crucial for modelers to improve their simulations. Therefore, I recommend to accept it with the following minor changes.

Specific Comments:

1) Abstract Lines 15-18: For clear skies, the TOA instantaneous SW flux uncertainties are about 2.3% (1.9 Wm^{-2}), 1.6% (4.5 Wm^{-2}), and 2.0% (6.0Wm^{-2}) over ocean, land and snow/ice surface, respectively. For all skies, they are about 3.3% (9.0Wm-2), 2.7% (8.4Wm-2), and 3.7% (9.9Wm-2).

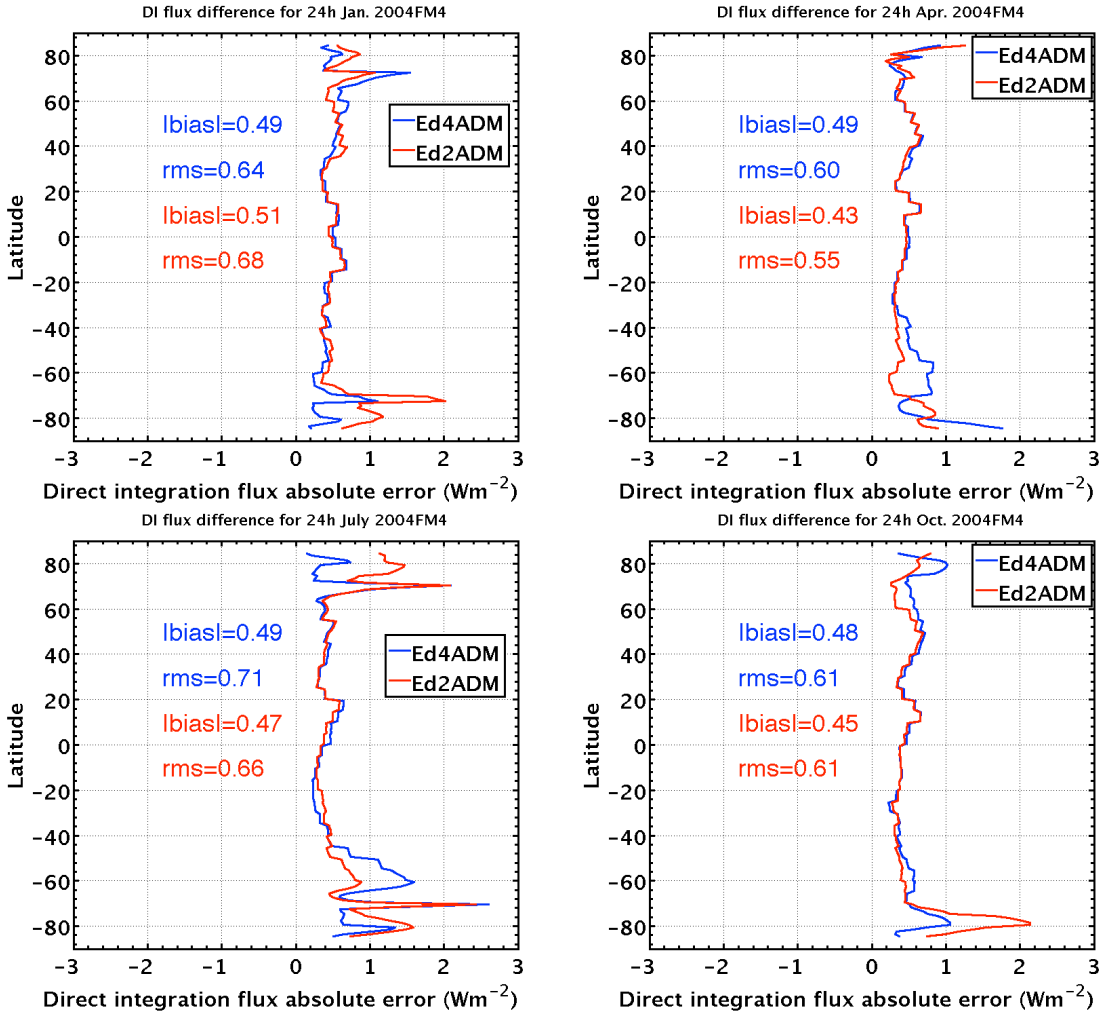
2) Abstract Lines 20-23, as well as the similar sentences in the text and summary. Following 1).

We modified the related descriptions as suggested.

3) Table 1 shows that the biases of the global SW and LW fluxes using new ADMs are less than those from old ADMs, while Tables 2-3 show the opposite results, why?

The RMS errors determined from the direct integration for Ed4 and Ed3 are essentially the same if we round the RMS error to a tenth of a Wm^{-2}. We agree that the biases associated with the Ed4 are slightly higher than those associated with Ed3, but this is mostly due to compensating errors in Ed3. As shown in the figures below that the mean absolute biases between these two editions are quite similar (to within a tenth of a Wm^{-2}). The most noticeable differences are over 50S-70S, where the mean absolute biases using the new ADMs are higher for April and July. The new method used to construct LW ADMs over cloudy snow/ice scenes takes the cloud emissivity into account via cloud optical depth (see section 5.4 in Su et al (2015)). This could mean that cloud optical depth retrieval over sea ice under large solar zenith angles (>60°) is less reliable, but

further study is needed to answer this question. Some discussion is added in Section 2.2.



4) The flux uncertainties in Table 5 are slightly different to the values in abstract, which one is correct?

Sorry for the confusion. The shortwave flux uncertainties presented in the abstract are based upon both CERES-MODIS test (Table 5) and multi-angle MISR test (Table 7). We modified the abstract and conclusion to make it clear. "The averaged TOA instantaneous SW flux uncertainties from these two tests…".

5) Figures 6-9, is it possible to think other ways to show your results more clear than current way? The current plots are hard to read and understand. Following is an example although you do not have to use the same style.

We redid the figures 6-9 to show each surface type separately. For example, we split figure 6 into 3 figures (one for ocean surface, one for land surface, and one for snow/ice surface). We also used "hatched" bars for multi-layer clouds to distinguish them from single-layer clouds.

We think the legibility is much improved. Thank you for your suggestion.

6) Summary part.
It is a little bit longer, and the % and Wm-2 in several consistent checks are larger than your claimed uncertainties, which may confuse readers a little bit.

We shortened the conclusion a bit. Again, the TOA instantaneous SW flux uncertainties are based upon the averages of the two consistency tests and the TOA instantaneous LW flux uncertainties are based only upon the CERES-MODIS consistency test.