

## ***Interactive comment on “Uncertainties in cloud phase and optical thickness retrievals from the Earth Polychromatic Imaging Camera (EPIC)” by Kerry Meyer et al.***

**Anonymous Referee #2**

Received and published: 22 March 2016

This manuscript reports retrieval uncertainty in cloud phase and optical thickness from EPIC measurements, part of the DSCOVR mission. The authors use current MODIS cloud products as a baseline, and then discuss the sources of EPIC retrieval errors introduced by the limitation of channels (and thus the method itself), and by the coarser resolution of EPIC.

The manuscript is well structured and well written, although it could have been more concise (see specific comments below). The sensitivity tests are rather standard, but indeed it is important to report these results to provide a good reference for future operational cloud products. I only have a few minor comments for the authors to consider.

Specific comments:

C1

1) While it is great to reinforce key differences between MODIS and EPIC, there are a lot of text repetitions in the manuscript. For example, the part about fixed cloud effective radius on Page 2, 4 and 6. It is also mentioned many times about why it is necessary to use dual thresholds for cloud phase determination, etc. I would recommend reading through the whole paper again, then the authors will realise that many same references are mentioned over and over again, indicating that some reorganisation could be made.

In addition, Page 7, Line 33-35, I find the sentence is interesting but not necessary, because why one would like to select an inappropriate cloud temperature threshold?

2) Page 9, Line 7–11: Could the authors please explain why large retrieval errors occur at certain scattering angles?

3) Page 7: it would have been better if the authors tried to implement zonally-dependent cloud temperature thresholds. Or at least, the author could analyse MODIS cloud products to support the temperature range used in Figure 5.

4) Regarding Figure 5 and Page 5, it is not immediately clear if both thresholds increase 1K, or the authors change one at a time. Please make it clear in the text and the figure caption.

5) Page 4: It is mentioned that different data sets are used for atmospheric profiles. Could the author please explain why, and elaborate on the potential impact on retrievals?

6) Page 5: It is not immediately clear if retrieval is performed at MODIS pixels or at EPIC pixels for "EPIC proxy version", although one can figure it out later when reading the result section. It would be good to make things a bit clear here.

---

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-6, 2016.

C2