

Interactive comment on “Cloud Products from the Earth Polychromatic Imaging Camera (EPIC): Algorithms and Initial Evaluation” by Yuekui Yang et al.

Anonymous Referee #1

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This manuscript presents a simple algorithm description for deriving cloud properties from the EPIC camera located on the DSCOVR satellite, and makes initial comparisons to independent observations derived from combinations of LEO/GEO data. The cloud properties reported include a cloud mask, cloud top height (CTH) & temperature (CTT), effective cloud fraction (ECF), and cloud optical thickness (COT). In the case of COT, both liquid and ice phase COT retrievals are reported. A total of four weeks of data are investigated, with one week drawn from each of the seasons.

EPIC is making a first of a kind observation from Lagrange point 1 and this study certainly warrants publication. This is a short and concise paper that is well organized

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and to the point. The only problem is a lack of background description on how the data is obtained in the instrument and re-gridded and then used for Level 2 cloud retrievals. If this has been described at length in previous papers or ATBDs, this information needs to be conveyed in this paper because it is not clear how this unique viewing perspective of Earth and 7-minute long data acquisition cycle are reconciled.

To be specific, the Earth rotates 15 degrees in an hour, which translates to 1.75 degrees in 7 minutes. If the channels are acquired in sequence (is this the case? And If so, does it start with 317 nm and end with 780 nm?), the Earth advances 0.175 degrees in 0.7 minutes (42 seconds) during one channel acquisition, which is about 19.4 km of Earth rotation at the equator. Therefore, from channel to channel, the Earth rotates about 2.5 pixels in distance at nadir. How is this dealt with? The authors need to have some added discussion on this, or clarify that this is incorrect and that the instrument operates in a different manner.

Table 1 states that the cloud products are obtained at the “native pixel size”, which is about 8 km at nadir. How much bigger do the pixels get at the edge of the Earth disk? And how is the “re-gridding” consistent with keeping a native 8 km resolution at nadir?

Other comments

Throughout the manuscript “etc.” is used in place of quantitative information. These instances must spell out exactly what is intended by “etc.” because in all cases it is not clear at all what is meant.

p. 1 line 27: ...capability not previously available. . . p. 1 line 28: delete “in the past” p. 2 line 24: ...retrieval are run. . . p. 4 line 2: what is the impact of the 6 m/s assumption? Can the authors add an error estimate(s) based on known climatologies of wind speeds within and outside of storms in different latitude bands? p. 4 line 4: relatively p. 7 lines 10-11: what is the size of the EPIC pixel PSF at half-max? Are they the same for all 10 channels and all elements of the CCD array?

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