

General Comments:

This study examined the trend of Earth's albedo using DSCOVR EPIC measurements. The trends derived from EPIC are comparable with those inferred from CERES measurements. Both datasets indicate that Earth's albedo has decreased since 2016, with the rate of decrease becoming larger after 2022. Because the CERES mission has been the sole satellite mission monitoring Earth's energy imbalance, an additional independent mission such as EPIC provides an important means to validate the existing CERES observations.

The study addressed the stability of the radiometric calibration of EPIC. However, the EPIC instrument measures only narrowband radiances from a single viewing direction, at wavelengths shorter than 780 nm. Deriving broadband albedo therefore requires angular and spectral integration, which involve assumptions about atmospheric profiles, surface types, and cloud properties. The angular integration refers to integration over the viewing angles. The study does not discuss uncertainties associated with these angular or spectral integration steps. In addition, the impact of changing phase angles is not discussed, nor is the methodology for applying phase-angle corrections described in the albedo time series. The effect of the portion of Earth not observed by EPIC also warrants consideration.

Estimating these uncertainties is crucial for determining whether the detected trends are statistically significant. Given the likely magnitude of these methodological uncertainties relative to the inferred albedo trend, I recommend a major revision before publication in EGU sphere.

Specific Comments:

1. Are there uncertainties in the derived albedo trend associated with the phase-angle shift around 2020? Because the phase angle directly affects the measured bidirectional reflectance, it should influence the estimated Earth albedo. Notably, the timing of the observed change in the albedo trend coincides with this phase-angle transition.
2. This study evaluates calibration reliability based on two components: (i) the stability of EPIC's narrowband radiometric calibration and (ii) the stability of the lunar albedo under viewing geometries consistent with previous studies. These assessments support the stability of EPIC's narrowband radiance accuracy, but they do not validate the accuracy of the angularly and spectrally integrated fluxes or albedo. The uncertainties associated with the methods used for angular and spectral integration should be discussed.
3. This study cites Su et al. (2018) and Penttilä et al. (2022); however, it appears that a different approach to the angular and spectral integration was used here. If so, please clarify the differences and justify the choice of the new method.

4. Line 179: *"EPIC multiplicative albedo calibration coefficients (Table 1) are used to convert counts per second into top-of-atmosphere Lambertian albedo $A\lambda = \pi I\lambda/S\lambda$ where $I\lambda$ = the outgoing radiance at the top of the atmosphere and $S\lambda$ is the incoming corresponding solar flux."*

The radiance measurements in this study were converted to albedo by assuming a Lambertian surface. However, this assumption is rarely realistic in practical applications. When anisotropy is not accounted for, the resulting Lambertian albedo becomes highly sensitive to the viewing geometry. The uncertainties associated with this approach should therefore be discussed.

5. Line 241-242: *"The albedo estimates for these channels, 687.75 ± 0.2 and 768 ± 0.2 nm are much lower (Fig. 7) than for surrounding non-O₂ absorbed wavelength channels."*

This result indicates that the spectral integration is highly sensitive to atmospheric and surface conditions, especially cloud conditions for O₂-absorbing bands. Without characterizing atmospheric and surface properties, it is difficult to derive broadband quantities from narrowband measurements. How was this accounted for in the study? Simply weighting by the solar flux is not sufficient to obtain a physically meaningful broadband albedo. For example, trends in water vapor, cloud, and surface characteristics produce different spectral signatures in albedo. When TOA albedo changes in the visible and near-infrared spectral ranges are not aligned, how can this be considered? With the current method, these spectral signatures would not be captured, potentially leading to biases in the inferred broadband albedo.

By excluding the O₂-absorbing band and averaging, the results may partially reflect albedo changes under cloud-free conditions. If the global trend is primarily driven by clear-sky factors, such as surface albedo, this approach might capture the corresponding global changes.

6. Line 143: *"corrected for a small missing portion of the Earth's surface not seen in each EPIC image (3 to 8%) depending on EPIC's orbital position."*

How was the unseen portion of Earth accounted for in calculating the albedo? If the extent of this unseen portion varies, would such variations affect the albedo time series? Please provide the uncertainty ranges in the albedo estimates associated with changes in the missing portions.