Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2020-223-RC2, 2020

Atmospheric Measurement Techniques Discussions

Interactive comment on "Solar tracker with optical feedback and continuous rotation" *by* John Robinson et al.

Anonymous Referee #2

Received and published: 11 August 2020

While it appears that solar tracker design continues to be a game of reinventing the wheel, the authors of this manuscript describe a handful of useful innovations not typically employed in other trackers. Notably, the use of the coaxial power transformer – allowing 360 deg rotation without the typical wear on moving wires – is a significant improvement on past designs. The system is shown to be precise and reliable enough to be used in remote locations with little need for operator input following the initial alignment.

However, I share the concerns of Reviewer #1 that certain sections could be significantly improved by re-writing with a better focus on the narrative progression. Also, while the authors dive in with significant details on some portions of the design, other sections read as if their inclusion was simply an afterthought (e.g., two brief sentences

regarding the cover for the tracker – a critical component of any remotely operated system.)

The manuscript will certainly be very worthy of publication upon addressing the issues laid out by Reviewer #1 (whose comments I fully agree with) as well as these additional specific comments:

Lines 64-77: Section 2 Intro – I suggest improving the clarity of this section intro with a more direct connection between the question posed on line 65 (accuracy required) and the answer of 0.05 deg given on line 74.

Line 70: comma after MIR

Line 98: "...needs used within..."

Line 99: please include version of PyEphem

Line 163: "...are also simple, AND easy to implement and comprehend"

Line 201: How does the system respond to a partially obstructed solar disk (sliding along the edge of a cloud over many seconds). And how does it recover after such an episode? Could you increase the 0.001deg/sec offset adjustment based on the degree of signal difference within a sensor pair to more quickly recover?

Line 230: Reference to webserver before the webserver is introduced.

Line 250: The threshold level setting procedure / choice of hysteresis parameter is not particularly clear. How do you define "works well" when set at 10%?

Line 260: drop s from mains?

Line 288: Does simply passing the reference point in normal operating mode sufficiently maintain the rotator stage's knowledge of its position? While such knowledge may not be necessary in active tracking, is it not still needed in the passive ephemeris tracking mode?

Line 333: Space after Fig.

Line 367: Why is the tracking accuracy not regularly analysed for the other two trackers you have built?

Line 370: While I applaud the addition of the wall image in the design – certainly a very useful visual for a lab operator in the room – I would hardly refer to it as a valid means of monitoring the tracking accuracy, especially for a design which you emphasize can be efficiently operated remotely. I recommend de-emphasizing the quick visual method, and perhaps more clearly highlighting the consistency of the offset errors as a function of alt/az.

Line 410: Given that the offset errors are a function of alt/az, how useful is a single alt/az setup offset parameter pair? I imagine these much be updated throughout the year?

Line 516: This manuscript regularly emphasizes the remote operation of this tracker. Thus, a reliable automated cover is a critical component of the design. I believe it would be very appropriate and desirable to include more information on the cover design in this manuscript.

Fig 13: Despite being well within the required accuracy requirements, I would like the authors to speak to the changes in S-G parameter seen in November 2018 and in early Jan 2019 ahead of the optics cleaning

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