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Atmospheric Measurement Techniques Discussions

Interactive comment on "Automated Enclosure and Protection System for Compact Solar-Tracking Spectrometers" *by* Ludwig Heinle and Jia Chen

Anonymous Referee #1

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This manuscript clearly and exhaustively describes an enclosure for a mobile solar-tracking spectrometer that can allow for greater measurement frequency and improved protection for the instrument against rain or other bad weather. The manuscript is very readable and describes the system effectively, but could use a small bit of English usage editing. There are a few small points that I see as useful additions:

Size, power, and weight are not described.

The measurements use a laptop computer, which is not shown in the schematic diagrams. While it is clear that most operations will use remote access software to control that laptop computer, it may prove necessary to access the computer occasionally. Does physical access to the computer require opening the enclosure?

The cover rotation encoder appears to be a relative encoder, gaining absolute position information by seeking a limit switch, but the text is not fully clear on this point. Please give a little more detail.

Minor / typographical points:

Page 1, line 4: The measurements are are not truly continuous in time; they require direct solar viewing (clear skies, daytime). Maybe find a better wording?

page 1, line 11: I think the authors mean "foundation" instead of "fundament"

page 6, section 2.2.2: This is a good calculation of the azimuthal dependence of the viewing geometry, but it appears that the scanner cannot view the zenith, so at some low latitudes where the sun can get close to the zenith, the cover will block the view, causing a gap near local solar noon. Please provide a calculation of this effect.

page 7, line 4: I think you mean "single" magnet where it says "singe"

Page 9, line 2: It appears that there is no seal between the circular tracker base ring and the enclosure, so it seems like ambient air (and humidity) can get into the enclosure. If the ambient T > 25°C and RH is high, condensation is possible. Please describe if the system is sealed at this point or not and if so how.

Table 1 shows a laptop in the power budget, but the system drawing (Figure 2) does not show the laptop.

page 12, section 3.1.2: It appears that the encoder for the motion of the moving cover determines relative motion direction and "steps" as each magnet is passed. This type of controller needs a limit switch to determine absolute position, which is presumably the closed switch. Therefore, the microcontroller needs to keep track of the absolute position in software. Potentially this is not fully explained, or potentially there is some absolute position encoding with the magnet scheme that needs further explanation.

page 19, top: A lighter weight version of the enclosure is mentioned, but I don't think

that the actual weight of the current system is discussed. It would be valuable to give the size and weight of the current enclosure system.

page 19, line 15: missing a space in the two words "increased amount"

page 19, line 20: Again, I think "fundament" should be "foundation"

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