



## ***Interactive comment on “Systematic and rapid extraction of direct downwelling irradiance estimates from Campbell-Stokes sunshine recorder archives” by A. M. Horseman et al.***

**Anonymous Referee #2**

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It is difficult to see, how the title "Systematic and Rapid Extraction of Direct Downwelling Irradiance Estimates from Campbell-Stokes Sunshine Recorder Archives" fits the aim of the paper. The aim is described on page 8745, line 2: "The aim of the method to this point is to transform the scans of Campbell-Stokes recorder cards into a self-consistent archive of rectified and registered images and meta-data in a form that can be readily analysed." It is further stated (page 8745, line 13): "The purpose of the automation and future analysis is to provide a record of solar insolation data similar to that available from pyrheliometers, but from locations and times beyond the existing solarimeter network." Pyrheliometers are used to measure the direct insolation (W/m<sup>2</sup>)

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in the direction of the sun. To me that goal seems not to be possible, because under no circumstances the Campbell-Stokes sunshine recorder mirrors insolation under cloudy skies. And under certain cloudy skies there still is insolation in the direction of the sun (see Fig 6 around 8:00 and 13:00 time of day UTC). The authors should rectify their wording and their aims and should not state the aim so late in the paper. The described method to produce rectified and registered images of the Campbell-Stokes records is worth being published in AMT, however it could be shortened by 50%. Further remarks in detail: 8730, 7: Explain pxh<sup>1</sup>. It is not a SI unit. 8733, 15: What are "bright sunshine cards"? Cards on days without clouds? 8735, 5: Explain 200 dpi. 8735, 19: Add date the URL has been visited. URL contents are volatile. 8735: Scanner colour calibration could be shortened. 8737, 1: I miss as metadata or quantified data the "colour" of the cards. The colour of the cards is changing the absorption properties of the cards and the burning process. Often (certainly in the past) the observing stations order new cards presenting an old card. This way, it could be observed that over the years the colour is changing. 8737, 5: "UK Met. Office" – not all readers are used to common UK terms. 8737, 8: Explain RGB 8738, 23: See remarks for 8737, 1 8743, 13: Skip 200 dpi, it is misleading here. 8743, 21-22: 2150x244 what units? 8744, 18: The paper has the tendency of extending the text, so a number of redundant expressions are used. An example is Greenwich Mean Time, which can be deleted, because UTC is used in the same line. Fig 3: Not needed, it is covered in the text. The next phrase again is an example. 8745, 11: Very good observation – that opens a chance to calculate the atmospheric vertical temperature profile as well (no joke!). 8746, 9: At least at this point the colour of the chart becomes important (google for Campbell-Stokes and look for pictures) Tab 1: Could be deleted Fig 6: A simple layout instead of this pseudo magnified one would do it.

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