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Cloudiness retrieved from All-Sky camera and MSG satellite over Reunion Island and Antananarivo Madagascar by Jean-Marcel Rivonirina et al.

General Comments:

This paper makes use of ground-based all-sky observation from the UV-Indien network provided by the Reuniwatt company. In order to measure cloud fraction, the camera images were analyzed using an existing industrial algorithm developed by the Reuniwatt company and another algorithm Elifan developed by CNRS. The authors have used all-sky images from two sites, Antananarivo, Madagascar, and Saint-Denis of Reunion Island, to evaluate the performance of two different algorithms used to analyze the all-sky images. Authors show strong agreement between the two algorithms Reuniwatt and Elifan (Bias=-5.48%, RMSE=6.48%, and $r=0.99$). To cover the large area authors used cloud products from the Meteosat Second Generation (MSG) satellites. Comparing camera and satellite observations a reasonable consistency between them has been shown, the significant biases are interpreted due to different spatial coverage by camera and satellite. Cloud properties in two locations in the southwest Indian Ocean, Antananarivo, Madagascar, and Saint-Denis of Reunion Island, have been examined using long term imager and MSG observations. Seasonal variabilities of cloud fraction over Antananarivo and Saint-Denis obtained from Reuniwatt and MSG during September 2019 - Jun 2022 has been reported. Antananarivo shows different diurnal variations in the cloud fraction during dry and wet seasons. However, in Saint-Denis, the morning skies are generally clear but cloud cover increases throughout the day during wet and dry seasons.

In summary, I see potential in the manuscript and it may eventually meet *Annales Geophysicae*'s standards after a substantial **major revision** after addressing my concerns listed below.

Specific comments:

Lines 124-125: "In all cases, the sun pixels are considered as clear sky pixels in the segmented image". If the sun is in FOV, the pixels are expected to saturate in 30 sec. What are the saturation charges of the camera (CCD or CMOS) in ADU (Analog to Digital Unit)? Please clarify the meaning of levelling the pixels into the 'sun' category.

Lines 149-150: "To crop the observed image, we have selected a 70° radius angle around the zenith, which is equivalent to the angle chosen in the Reuniwatt algorithm" What is the logic to reducing FOV to 140°? As can be seen in Figure 2(a), in the white circle still building can be seen in the FOV.

Figure 3: Figure fonts are too small to be visible. The title of each image should be date in YYYY-MM-DAY and time in HH:MM:SS format with x and y axes values as the pixel number. I can see they are full images but do not have a size of 2kx2k; please clarify. How accurately do you generate the red circle in the images? What is the spatial resolution of the all-sky imagers used in this work?

Section 2.4.3 and Table 2: How the absolute threshold for cloud and blue sky was generated as shown in Table 3?

Figure 4: What are the advantages of giving pseudo color to the images? What is the unit of the scale shown in Figures 4b-e?

Section 2.6: what are x_i and y_i in the equations? Please mention them in the manuscript.

Lines 261-280: What is the area covered by MSG in 3x3 pixels vis-à-vis the area covered by a ground-based imager considered for this comparison? As correctly said “Increasing the window size tends to amplify the differences between camera and satellite observations.” Therefore, before concluding that 3x3 pixels of MSG cover the same area, discussion on the area covered by the ground based observation needs to be compared with the MSG observations rather than trying different window sizes.

Technical corrections:

Line 37: Please provide a reference for. “Generally, clouds cover more than half of the Earth's surface”

Line 71: every 15 mn should be every 15 minutes. You may use minutes or min throughout the manuscript.

Line 94 and 103: Generally, we follow (latitude, longitude) unless it becomes necessary to interchange them to convey a specific message. Be consistent in the manuscript text and Table 1 while mentioning lat, lon. How authors found a three-digit accuracy in lat. and long values?

Lines 100-101: “Our study contributes to filling the gap in our understanding of this site, allowing for inter-comparison of ground-based instruments with spatial observations” may be rephrased for clarity.

Line 114: Camera FOV is 180° for a fish-eye lens. What do authors mean by FOV of $360^\circ \times 180^\circ$ around the site?

Lines 198-199: correct “Bleu Sky” to “Blue Sky”

Figure 4: I cannot see the “red circle, and the object mask in black” in Fig. 4a.

Line 282: Figs. 7 and 8