

1 First fully-diurnal fog and low cloud satellite  
2 detection reveals life cycle in the Namib

3 — RESPONSE TO REVIEWER 1 —

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6 We would like to thank referee 1 for her/his review of the manuscript and  
7 her/his constructive criticism. Comments by the referee are colored in blue,  
8 our replies or comments are colored in black.

9  
10 A good algorithm to obtain the detection of fog and low cloud using the  
11 temporal continuity of MSG-SEVIRI data, demonstrated as with high potential  
12 for use the product for many applications (for example agriculture). This work  
13 represents a novelty because it permits to detect fog and low cloud continuously  
14 during day and night with very high performances in terms of statistics. In  
15 general, I find this technical paper worth publishing. The technical part is well  
16 written, very clear, fast to read. Validation and result sections are very well  
17 deduced by the authors. Comments (given below) are suggested to be followed.

18  
19 Page 2 Line 26 – From my point of view would be worth to give a brief  
20 description of the paper sections.

21 We agree with referee 1 that a brief structural overview can enhance the clarity  
22 of the manuscript and have now included this at the end of the introduction:  
23 ” *This work is structured as follows: The data used and the novel FLC-detection*  
24 *technique are described in section 2, a statistical evaluation of the algorithm is*  
25 *given in section 3. Spatiotemporal patterns of fog and low clouds in the Namib*  
26 *are presented in section 4, conclusions and an outlook are given in section 5.*”

27  
28 Page 3 Line 1 – I would rewrite the sentence in this way: “ The data used  
29 in this study cover the period 2015-2017 in the region 13.5° s-35° S and ???-20°  
30 E.”

31 We have adjusted the text passage to say: ” *The data used in this study*  
32 *cover the period from 2015–2017 in the region from 13.5°S–35°S and from*

33 *10° E–20° E, considering only regions over land.”*

34

35 Page 3 Line 6 – Please explain better what is intended for “...if needed,  
36 the application of structural image analyses.” Are there cases in which this  
37 analyses can be skipped? If yes maybe can be useful to report it/them.

38 The structural image analyses are only needed if none of the spectral tests is  
39 true. The follow-up sentence tries to communicate this: “*Sequential testing*  
40 *stops once a class is determined, the following tests are not carried out.*”  
41 However, we agree with referee 1 that this may be stated more clearly in the  
42 initial sentence and have rephrased it as follows: “*The initial classification of*  
43 *a given scene is designed as a decision tree, with sequential application of a)*  
44 *simple spectral thresholds as shown in table 1 and, b) if none of the spectral*  
45 *tests is true, the application of a structural image test.*”

46

47 Page 3 Line 7 – “Contextual plausibility control” is the same operation  
48 that “structural image analyses”? Please resolve this (from my point of view)  
49 ambiguity.

50 The contextual plausibility control is one of two structural image analysis  
51 techniques used in this work. To clarify:

52 The initial classification is the two step technique that consists of a) spectral  
53 thresholds and b) the SSIM test. The contextual plausibility control is intended  
54 to review the results of the algorithm and check the plausibility of the detected  
55 FLC pixels. Both (SSIM test and contextual plausibility control) can be  
56 described as structural image analyses, as is done on Page 3 Line 6.

57 We agree with referee 1 that this can be stated more clearly and have rephrased  
58 said text passage: “*The initial classification of a given scene is designed as*  
59 *a decision tree, with sequential application of a) simple spectral thresholds as*

60 *shown in table 1 and, b) if none of the spectral tests is true, the application*  
61 *of a structural image test. Sequential spectral testing stops once a class is*  
62 *determined, the following tests are not carried out. The additional contextual*  
63 *plausibility control is only tested for FLC pixels.”*

64

65 *Page 3 Table 1 – In Table 1, please specify threshold measure unit (I think*  
66 *is Kelvin degree).*

67 Thank you for pointing this out, units are now included in the table.

68

69 *Page 5 Line 16 – I think Figure ??? is Figure 2b), please correct it.*

70 Yes, indeed. This is now corrected in the manuscript.

71

72 *Page 8 Line 20 – in order to improve the comprehension, I think is good to*  
73 *draw highlight the edges of the three core regions in Figure 4.*

74 While we understand the point of referee 1, and agree that highlighting the  
75 core regions would help identifying them in the figure, we would like to keep the  
76 figure as it is. Our argument is that drawing the regions directly into this results  
77 figure would, in our opinion, already introduce somewhat of an interpretation  
78 and potentially bias a reader.