

**Meteosat SEVIRI Fire Radiative Power (FRP) Products from the Land  
Surface Analysis Satellite Applications Facility (LSA SAF): Part 1 -  
Algorithms, Product Contents & Analysis  
Changes Made and Reply to Reviewers Comments**

**Changes made to the manuscript**

We have made all the changes suggested by the reviewers below - and detailed them in the point by point discussion shown below. In addition in response to **Anonymous Referee #2** who suggested potential "cosmetic" shortening of the manuscript, we have shortened some text, moved Section 7 and some Figures and Tables to Supplementary Materials, and merged two figures into one (new Figure 12). This has resulted in a manuscript substantially shortened but without information alternation, as the Referee requested.

**"Point by Point" reply to reviewers comments**

**G. Petroplulos**

I think the paper is very clear in overall, but perhaps authors could provide more detail on section on "Comparison to MODIS and analysis of active fire trends".

Response: We have provided some more detail here and pointed the reader to the companion paper (Roberts et al., 2015) where much more detail is contained on this topic.

**S. Lamine #1**

The manuscript has generally a good structure; but I found some areas that need adjustment and careful checking and the authors are kindly requested to look at them: Line 2, please delete the word "best" and use "is achievable using..." Page 15835, Line C5579 needs rephrasing, use "part" and "with 15 minutes time interval" Page 15837, Line 25, use "Each rotates at a speed of 100 rpm" Page 15838, Line 19, check the unit of the number you mentioned there, Page 15838, Line 23, use "resulting to a final image spatial resolution of 6 km" Page 15839, Line 10, use "Where they are..."

Response: All suggested textual checks and adjustments have been made.

**S. Lamine #2**

-In the title 2.1, please use the acronym MSG -Not defined acronyms in the text (GHG, SSP)  
Response: All suggested textual checks and adjustments have been made.

Please try to be as concise as possible in the titles of the figures.

For example in Fig. 23 instead of "In (a) is the total number..." use "(a) the total number..."  
Suggested textual changes made.

All sections of the paper are well structured but a careful check of the included EQUATIONS is kindly requested.

We have checked all equations in line with the referees suggestion.

### **Anonymous Referee #1**

Page 15835, line 2 - “3 km spatial resolution”. Here and in the abstract (page 15833, line 18), the text gives the impression that SEVIRI pixels are 3-km in size. However, as noted later in the manuscript, the combination of the 4.8-km SEVIRI IFOV and 3-km ground sampling distance result in “a final image resolution of around 6 km” (page 15838). Please make the text consistent.

Text adjusted to state that the "ground sampling distance between SEVIRI pixel centres at the sub-satellite point (SSP) is 3 km, whereas the instantaneous field of view (IFOV) for each detector is 4.8 km × 4.8 km (full width at half maximum; FWHM), resulting in a final image resolution of around 6 km at the SSP (Just, 2000)" and the abstract made consistent with this.

Page 15837, line 16 - “whist” → “whilst”. Page 15837, line 24 - Delete the word “currently” since it is redundant after saying "At the time of writing..." Page 15838, line 18 - “SEVIRIs scan mirror” → “SEVIRI’s scan mirror” or “the SEVIRI scan mirror”. Please also fix in line 28. Page 15838, line 23 - Please correct garbled pixel dimensions (presumably “6 km × 6 km” was intended). Page 15840, line 24 - “Kelvin” → “kelvins”.

All suggested textual changes made.

Page 15852, Eq. (18) - Strictly speaking, this equation is incorrect since, as written, it indicates that the partial derivative is to be taken with respect to the index  $k$ . For clarity and correctness it would be better to write the partial derivative as  $\partial \text{FRP} / \partial V_k$  and say that  $V_k$  represents the variables of Eq. (16).

Good suggestion - we have made this change.

Page 15853, Eq. (20) - It’s not obvious that the error term  $\sigma_S$  can be combined in this way since saturation would presumably contribute a systematic rather than random error. Please clarify. I would also add an extra sentence or two in section 5.2.1 that justifies using the median absolute deviation about the median ( $\sigma_S$ ) as if it was a standard deviation in Eq. (20).

With regard to saturation and the term  $\sigma_s$ , it is explained in Section 5.2.1 that this is the uncertainty arising from the saturation correction, and so is not a bias but a random error - but one that is set to zero apart from when saturation occurs. We have explained this further in Section 5.1 and 5.2.

Page 15861, Eq. (23) - Comment above for Eq. (18) also applies here.

Good suggestion - we have made this change.

Section 7 (pages 15862 - 15864) - Please consider eliminating this section (including Table 4) since it deals with details of file access, naming, and formats, which are topics that are better relegated to online documentation, the ATBD, or a README file.

Section 7 material now moved to Supplementary Materials.

## **Anonymous Referee #2**

My only criticism involves the length of the manuscript, which is excessive. In particular, Section 7 may be better suited as part of an online document (e.g., Algorithm Theoretical Basis Document) in which data access links and file format/content could be regularly updated.

We have made reductions in manuscript length by shortening text and removing some unnecessary parts, and moving completely the Section 7 material to Supplementary Materials.

Similarly, Section 9.1 provides little useful information without any reference data to confirm the additional detections generated by the algorithm (and especially in light of the companion paper addressing the algorithm validation and product inter-comparison analyses). By making the manuscript shorter the authors will likely improve the readers' experience. This recommendation involves cosmetic changes to the manuscript which I thereby leave at the authors discretion.

We have made reductions in manuscript length (to 60% of the prior manuscript length) by shortening sections, including the one suggested.

Some specific comments are listed below:

Some acronyms lack proper description. See for example line 79, line 103, among others.  
Line 85: replace "plaid" with "played" Line 156: I believe you meant to say "Earth images"?  
Lines 183-185: If HRV data are not used I suggest you delete this statement.

Done

Lines 185-194: I suggest you shorten this passage eliminating information that may be easily found elsewhere (online, previous publications). Specifically, information on the scanning cycle and on data reception/distribution systems may be irrelevant to most readers.

Shortened.

Line 248: delete duplicate "in" in the sentence. Line 299: Do you meant to say Figure 5b?

Corrected

Line 333: Despite being informative, I believe Fig 7 may be deleted without prejudice to the discussion. It may suffice to use words to describe the situation (as you already did).

We have redone this figure and moved to Supplementary Materials to shorten the manuscript as suggested.

Equation 7: The use of "P = " appears unnecessary

Adjusted.

Line 399: Use of "true fire pixel" can be misleading - the resulting fire classification is still subject to false alarms. Please consider using a different terminology (same for lines 473 and 493).

Adjusted.

Line 463: Please verify signal - also make sure this is consistent with the definition of day/night listed in line 348

Adjusted.

Line 533: replace "lhs" with "left hand side". Same for line 545 (rhs = right hand side) Line 553: Correct sentence: "... this is not fully appropriate ..."

Adjusted.

Line 704: Fix typo: "To quantify this effect..." Line 711: delete "which" Line 798: Correct typo: "FRP-GRID"

Adjusted.

Line 816: It would be nice to see the adjusted FRP-PIXEL data plotted in Fig 18. We cannot do this as we do not "adjust" the FRP pixel data for the impact of "small undetected fires", rather we apply the bias corrections during the FRP-GRID generation.

Line 1111: Correct: "the same heights as was seen..."

Adjusted.

Tables 2, 3 and 5: Like Section 8, I believe all three tables belong to the product's online documentation/user manual.

Tables 2 and 4 and the Section are moved to Supplementary Materials.

Line 1543: Fix typo: "Figure 1". Also, having scale bars and legend (indication of brightness temperature range) would make this figure more informative. Some citations are missing in the caption (lines 1561, 1562, 1564).

We have updated Figure 1 as requested.

Figure 2: The authors should consider deleting this figure to preserve space. This is a generic figure that applies to the whole SEVIRI program - readers should be able to easily find that information in other publications/online material.

Figure moved to Supplementary Materials.

Figure 4: Please double check the orientation of the arrows in the diagram. For example, "Background analysis" appears to lead to an end point, whereas "If passed" + "N" seems to lead to an endless loop.

Done.

Figure 5a: Please specify what the x/y axes labels describe. Figure 6: I would encourage the authors to try and combine Fig 5 & 6 into one to conserve space. maybe find an case exemplifying both situations discussed in the text?

We have deleted Figure 5 to save space. We have added a new figure to show how further adjustments of the cloud masking procedure did not produce any notable benefit.

Figure 7: As listed above, I recommend deleting this figure to conserve space. A citation is also missing in the caption (line 1651). Line 1747: Correct: "are not shown due to ..."

We have moved an updated version of this figure moved to Supplementary Materials.