Review: Detection of convective initiation using Meteosat SEVIRI: Implementation in and verification with the tracking and nowcasting algorithm Cb-TRAM.

General:
This paper provides a description of a new detection method for convective initiation (CI) by combining methods within the Cb-TRAM algorithm with the SATCAST algorithm. CI is not currently being identified well by Cb-TRAM, hence making this work a meaningful contribution and enhancement to Cb-TRAM. The paper is well organized, and describes the methodology well. The procedure to determine improvements are also well described.

The paper, however, suffers from several grammatical problems, while one issue, that being of the very high false alarms, should be addressed prior to acceptance. The paper also uses an older SATCAST-based methodology, whereas a newer one exists, so additional justification should be needed. The paper would benefit from some additional background on CI nowcasting, rather than being very centric to Cb-TRAM. I also am suggesting that some of the text be removed to help shorten the paper, at it is a bit on the long side.

Major Comments:
(1) For the problem of high false alarm rates (FARs), it is my suggestion (albeit this is likely a lot of work) to determine a better way of verifying a "successful hit" of CI. The way it is now, as I understand things, is that only one pixel is allowed to link to one radar echo of CI, leaving the other satellite pixels in the near vicinity to just get labeled as "false alarms." In a similar exercise I was part of two years ago, using NWP model data to help verify satellite-based CI nowcasts, the same thing occurred. Hence, finding an appropriate way to validate this Cb-TRAM methodology would be preferred, which would significantly lower your FARs in a physically more meaningful way. One possibility would be to group adjoining pixels along the edges of (or within) convective clouds (re: Figs. 1 and 2) so that a future radar echo would mean that all pixels are successful hits. This implies that an object tracking framework be employed as part of the validation. This discussion related to the definition on page 1789, lines 18-19.

(2) The flow of the document would be substantially improved if commas were used. This is a difficult thing to correct, in that literally 50+ commas may need to be added as a means of making the sentences read easier, and in less confusing ways at times. A few examples are given in the minor comments below.

(3) The text becomes less technical and more conversational between pages 1794 and 1796. Suggest re-writing these pages with an emphasis on technical content only.

(4) In numerous places acronyms which were previously defined are not used. Convective Initiation (CI) should be defined once and then used as "CI" everywhere, and certainly, there is no need to capitalize "Convective Initiation" as it is not a proper noun.

(5) Page 1788: Related to the synoptic descriptions of the days of interest. This discussion needs to include references, and be cleaned up. In particular, I have no idea what is meant by "backward upper cold air masses". Please include a figure(s) or a reference, or just describe in more synoptically appropriate terminology. All three types of convective days should be described similarly, with more detail and references.

Minor Comments:
(a) Abstract, line 4: Initiation is spelled wrong, and no need to capitalize.
(b) Abstract, line 9: change to "…criteria aims to identify…"
(c) page 1773, line 5: Define "NWP" on line 2 and use "NWP" only on line 5, and everywhere else in the document.
(d) page 1773, line 18: Change to "As a result, nowcasting, i.e., …" Add comma to make sentence flow better.
(e) page 1773, line 29: change to "data are better"
(f) page 1774, line 2: Change to "An advantage…"
(g) page 1774, lines 8-10: Define all acronyms, e.g., RDT, MASCOTTE, etc.
(h) page 1774, line 18: change to "In the following study, a combination…" Add comma.
(i) page 1774, line 20: add common after "manuscript"
(j) page 1774, lines 27-29: There are perhaps five places where commas can be added in these two sentences.
(k) page 1775, line 14-15: Define all acronyms.
(l) page 1775, lines 20-22: Correct sentence -- presently it does not read well.
(m) page 1775, line 26: change to "…allows for calculation of…"
(n) page 1777, line 8: Define "AMV" in this location (not on line 26), and add comma in location after "vectors". See also page 1777, line 12.
(o) page 1777, line 15: suggest referencing "Berendes et al. (2008)" after the word "mask" [Berendes, T. A., J. R. Mecikalski, W. M. Mackenzie, K. M. Bedka, and U. S. Nair, 2008: Convective cloud detection in satellite imagery using standard deviation limited adaptive clustering. J. Geophys. Res., 113, 20207, doi:10.1029/2008JD010287.]
(p) page 1777, lines 27-28: Do not reference "UW-CIMSS", rather use Velden et al. (1997, 1998) for AMV algorithm. These are AMS publications and are ease to location.
(q) page 1778, lines 7 and 11: Do not reference "UW-CIMSS" AMV approach, just use "AMV".
(r) page 1778, line 12: Use the reference "Bedka et al. (2005)" after defining "MAMV". This is an AMS references, and should be easy to location.
(s) page 1778-1780: Suggest removing text from lines 22 (page 1778) to line 18 (page 1780). This is straight from several references, including Mecikalski and Bedka (2006), Mecikalski et al. (2008, 2010), and Roberts and Rutledge (2003). This would shorten the paper. Maybe only highlight the main points from this section in one shorter paragraph.
(t) page 1781, line 3: add comma after "algorithm"
(u) page 1781, line 27: change to "An additional objective…"
(v) page 1782: add comma on line 5 (after Typically), line 6 (after CI), line 9 (before CI), line 12 (after Thus), line 19 (after 2013)

(w) page 1782: no need to capitalize names of clouds, like "cumulonimbus"
(x) page 1783, equations (1)-(4): These could almost just be references, since they are very common, and hence there is no need to redefine them here.
(y) page 1786, lines 14 & 16 (and elsewhere in the document): What does "IF 2", "IF 3", etc. mean? Please define. See page 1794 as well.
(z) page 1787: Add comma on line 2 (after 2008), and line 12 (after conditions)
(aa) page 1788: Capitalize "Europe" everywhere in the document
(bb) page 1788, line 15: remove "for this feature"
(cc) page 1788, line 15-16: remove "in the further investigation"
(dd) page 1789, line 28: "halfed" should be "halved"
(ee) page 1791, line 25: remove the word "the" before "3 July 2010"
(ff) page 1794, line 10: change "founding" to "finding"
(gg) page 1794, line 17: change "developments" to "convective storms"
(hh) page 1795, lines 15-16: re-write sentence beginning with "Best FAR values…" It does not make sense as written.
(ii) page 1795, lines 27-28: Combine paragraphs -- no need for a 1 sentence paragraph.
(jj) page 1796, lines 13-22: Correct sentences -- at least two sentences are fragments, and not complete. Also, add commas to improve sentence flow.
(kk) page 1797, line 1: was "infra-red" every defined as "IR"? if so, use "IR".
(ll) page 1797, line 28, and onto page 1798: no need to redefine POD, FAR, CSI
(mm) page 1798, line 5: How can the BIAS be reduced from 320 to 146%? I thought BIAS was a number around 1? Please make more clear and/or correct.
(nn) page 1799, line 5: change "Unfavourably" to "Unfavourable"