We thank reviewer 3 for the time taken in reviewing our paper and for the very helpful comments, responses to which we detail below. In particular, we would like to thank R3 for the suggestions regarding better clarifications of the results, which we believe has allowed us to better communicate our findings to readers throughout the paper.

L1: First define the abbreviation.

We have now defined the abbreviation on line 1.

L8: Authors need to brief the kind of their suggestion as conclusion in the abstract part.

We thank you, Reviewer 3, for this suggestion. We have rewritten the abstract to better communicate our methods and contribution, and have made the suggestions to researchers more specific on lines 11-12.

L18: Which problem/limitation mentioned earlier to led to mention in the sentence "…DMSP-OLS nighttime lights data also has several important limitations?"

The sentence here (now on line 23) is referring to the problems that are now mentioned in the following sentences (lines 23-29).

L19: What about the effect of pixel resolution?

We are not exactly sure what R3 is referring to here and welcome further clarification. If the reference is to signal decay across and within satellite composites that can reduce (or increase) pixel resolution, these issues are discussed in appendix 3 and the sentences on signal decay on lines 36 - 41, as well as later in this response letter. But if we've misunderstood and the reference was to something else, we welcome additional clarification.

L23: I suggest authors for adding sources that studies are still using the DMSP-OLS data.

We thank the author for pointing out the missing citations. We have added citations to two articles using exclusively DMSP-OLS data in recent issues of *Remote Sensing* (there are others that use a combination of DMSP-OLS and VIIRS) on line 27.

L25: "..note.." or study?

We have changed "note" to "study."

L26-27: Authors need to include the source of such systematic shift, if already elsewhere in literature or to mentioned it as part of their study.

The study cited by Tuttle et. al. (2013) did not identify a source of the error, nor speculate on the cause. We also hesitate to speculate. We now note on lines 34-35 that the specific source of the problem in the satellite that causes a shift is not certain.

L34: Distinct in what way?

We have rewritten lines 39 - 42 to clarify that intercalibration techniques only address resolution incompatibilities across different years of analysis (especially across different satellites) and do not address positional issues in signal shift.

L46-48: What if the signal shifts from one year to other year systematic, will not be possible the shift (error) of the two-time window offset each other?

In the revised version of the article, we have now examined additional years through spatial cross-correlation (within the years covered by all satellites from DMSP-OLS composites were drawn) in both the new Table 1 and the new appendix 1. We also add additional visual inspections, like Figure 1 in appendix 2, for the remaining years of the F16 satellite and 2009. This allows us to evaluate the possibility that Reviewer 3 brings up, namely that two years that are shifted in the same direction. We do find this to be the case for 2004 and 2009 for the F16 satellite (and potentially for the first years and last years covered by other satellites). If a study was looking at *just* the difference between 2004 and 2009 using the F16 satellite, then we would not expect to see a systematic difference because the direction of the shift in both years appears to be the same. However, if the study was pairing any of the other years with 2004 or 2009, the shift would be present and an adjustment would be needed. We discuss this in detail on lines 95 - 101.

We also do not believe that shifts would be canceled out within boundaries. The direction of the shift from 2007 to 2009, for example, is to the southwest. This places a substantial amount of highly lit pixels on the Syrian coast into the Mediterranean Sea. Thus coastal pixels are systematically underlit. At the same time, as demonstrated by figure 2 panel b, subdistricts on the Syrian border with Turkey would receive extra nighttime light intensity from Turkish towns and cities on the Syrian border as those shift South. We now include both examples at the beginning of section 3.2, lines 128 - 130.

In section 3.2, we conduct a regression analysis using Syrian census data, finding that nighttime light intensity in subdistricts with higher populations was systematically undercounted. In effect, well-lit pixels in urban areas shift to less populated sub-districts in urban areas without a comparable return from the northeast.

L67: How to avoid such kind of labor-intensive type of identification through inspection? Are there any suggestion to make a fully (semi)-automatic identification?

We have made changes to the final paragraph of the conclusion (lines 177 - 183) to address this point. Specifically, we do highlight that an automated technique is likely the best solution to the problem further down the line, but we feel that the manual identification procedures -- from the moving window raster correlation that we introduce in the revision, to the visual inspection, to the placement of control points -- are essential steps to creating and validating an automated model. Validation of an automated technique is particularly important because actual changes in light emissions from year-to-year may be automatically detected as shifts and corrected. Thus, visual inspection will remain relevant, even when a more precise and quicker method exists for correcting signal shift.

L66-177: In the current version of the manuscript, there is mix-up of sections. I suggest following the journal guideline, such as, materials and methods, results and Discussions (which the discussion section can also be independent) – in both cases – the finding should be properly discussed, which is not the

case in the current version. Finally the concussions section, to conclude the major findings and suggest future area of study if needed.

We have changed the headings of each section in accordance with journal guidelines. We have also modified our discussion of the findings. In particular, we modify the first sentences of the "Conclusion" section (lines 154 - 161) to precisely restate the main methodological innovations from this study, as well as the results when those innovations are applied to an existing study using nighttime lights.