Quick Review for **How big is an OMI pixel?** by M. de Graaf, H. Sihler, L.G. Tilstra, and P. Stammes (amt-2016-61)

Graaf et al. present a study on quantifying the spatial size of OMI ground pixels, by matching OMI and co-located MODIS radiances in the visible spectrum. They fit a range of flat-top super-Gaussian spatial functions to match OMI and MODIS under a range of conditions, and compare the results to the OMI OMPIXCOR ground pixel product, the results of which show that the (visible channel) 75FOV OMPIXCOR pixels are a good approximation for the "true" ground pixels as determined by Graaf et al.

The manuscript is clearly organized and well written. It has benefitted greatly from the initial 2015 review and subsequent improvements made by the authors. Thus, very little remains to be criticized. The manuscript is well suited for AMT, and I propose to accept it for publications with a few minor, essentially technical corrections, as outlined below.

Comments/Corrections

Page 5, Equation (1):
The 2D super-Gaussian, as stated here, is not the most general form, since both dimensions use the same exponential power *n*. I assume that this is being done to (a) reduce computational requirements for the study, and to (b) use, and compare more easily with, the OMPIXCOR values without having to treat along- and across-track dimensions seperately. Later in the manuscript, the authors make mention of the fact that the two dimensions can be treated independently, but that this hasn't been attempted. I suggest adding a short sentence after Equation (1) to make that point clear right at the place of definition of the super-Gaussian.

Page 5, Equation (2):
Double-check that the weights are correct as written. In particular, whether the power of *1/n* should not rather be a *1/2*. What prompts me to suggest this is that a Gaussian's Full-Width at Half Maximum (FWHM) and its Half-Width at 1/e (HW1E) are related by

$$HW1e = \frac{FWHM}{2\,\mathrm{Sqrt}(\ln(2))}$$

Page 6, Line 197:
Delete "So, ".

Page 8, Line 246:
"2006 Sahara" should be "2008 Sahara", since the 2006 case is "not shown".

Page 11, Line 364:
"changes due to time differences"

Page 11, Line 370:
"optics like those of OMI"

Page 11, Line 377:
"presented in this paper"

Page 14, Figure 3:
Are the "Quadrangular" OMI pixels from the 75FOV OMPIXCOR product? If so, mention this explicitly since the essentially identical performance of OMPIXCOR and the super-Gaussians are an important result of the paper. If they aren't from OMPIXCOR, add some explanation on the significance of the close performance.

Page 15, Figure 5:
[1] Remove the color bar from each plot and add a larger version outside the individual images. As is, the color bar is too small to read.
[2] Add indications of “(a)”, “(b”), …, “(f)” in the figure caption.

Page 19, Figure 12:
[1] Move the color bar outside the figure and make it larger.
[2] As is, this figure conveys very little information, particularly in regards to the color-coded VZA values, since the data points essentially fall on the 1-to-1 line. Here is a suggestion to improve the plot: As X-axis, choose “average” reflectance values R = *(R_MODIS + R_OMI)/2*; these aren't “physical”, but they provide a common axis. Against this R, plot the difference in reflectance *dR = R_OMI – R_MODIS*, either absolute or normalized to either *R_MODIS* or *R_OMI*. In that way, the range of the Y axis will become more suitable to the small differences in reflectance, and the color-coding may actually become instructive. *N*, *y*, *r*, and σ can still be included, as well as the dashed line, though it should be fitted to dR in that case.