Figure S1. Global maps of SSA for four products, and their differences. SSA differences are based on collocated data (within 3 hours). Note that the products are available for different years, e.g. POLDER-SRON and FL-MOC do not overlap. No AOD threshold was used.
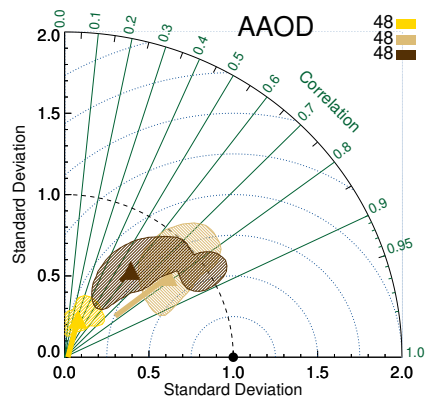
Figure S2. Taylor diagrams for the satellite AAOD products, when three products are collocated together. Shaded regions indicate $5\% - 95\%$ uncertainty range. Colours indicate satellite product (see also Fig. 1). Products were collocated together with AERONET, within 3 hours, and only 48 pairs of collocated data were available for analysis.
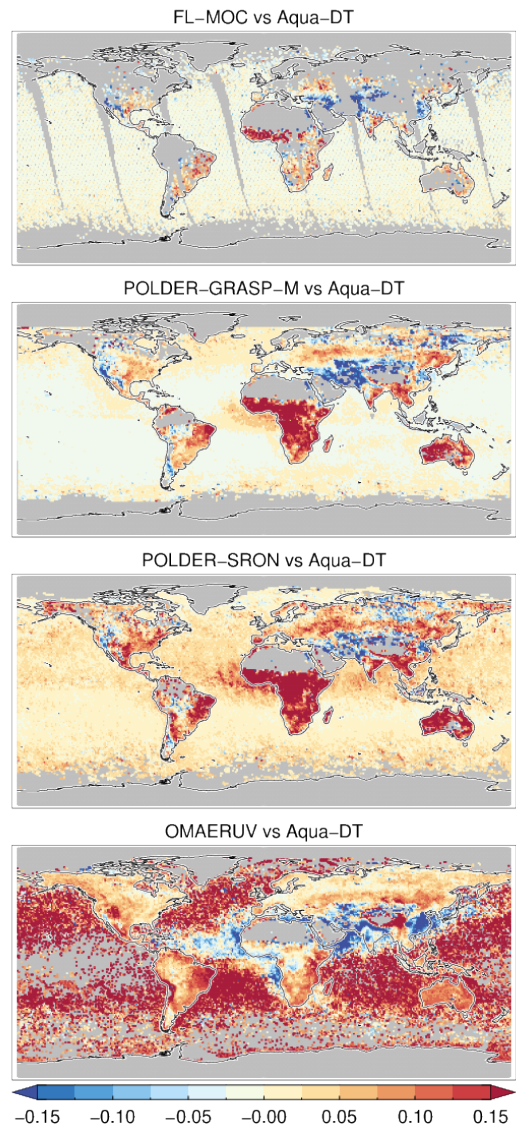

Figure S3. Global maps of three-year averages of AOD difference of four satellite products with Aqua DarkTarget. Products were pairwise collocated within 3 hours.
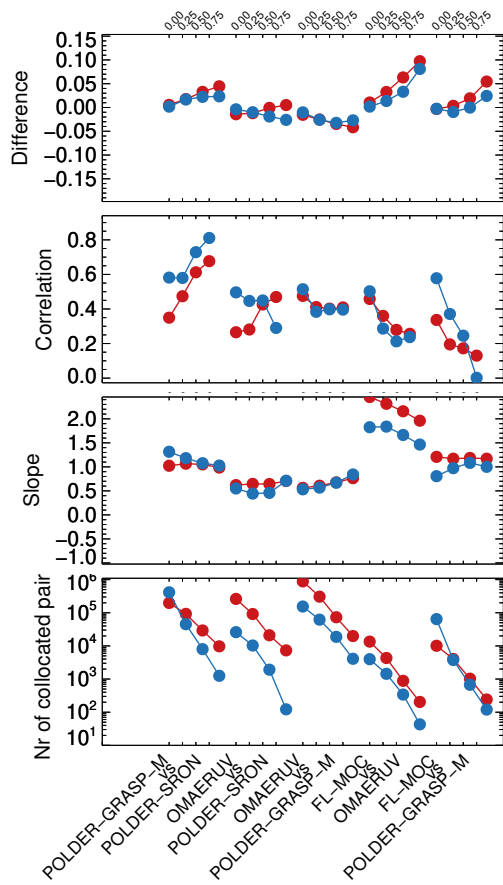
Figure S4. Comparison of different pairs of satellite AAOD, over land (red) and ocean (blue), for different thresholds of minimum AOD (0.0, 0.25, 0.5, and 0.75). The data were collocated within 3 hours.
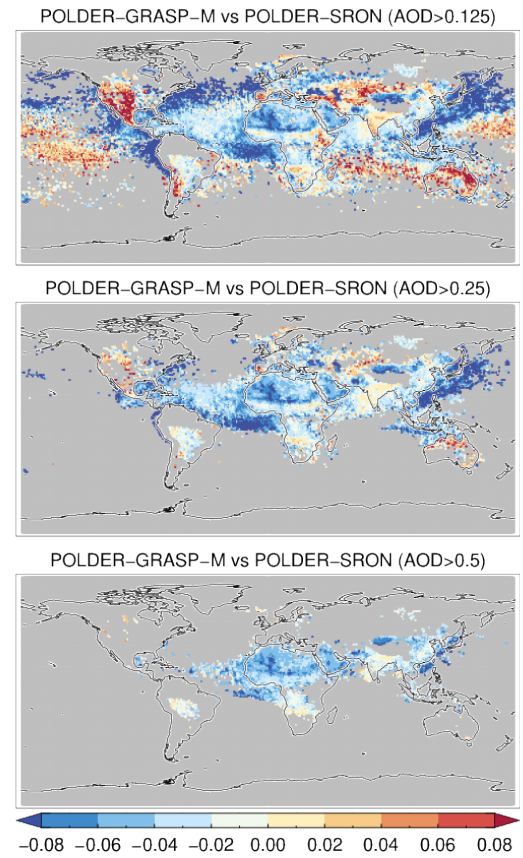

Figure S5. Global maps of SSA difference for 3-year averaged POLDER data, as a function of minimum AOD threshold. The under-lying super-observations were first collocated within 3 hours, then screened for minimum AOD, and finally averaged. Using a different minimum AOD constrains available data to a smaller part of the globe but has locally only a small impact on the difference.