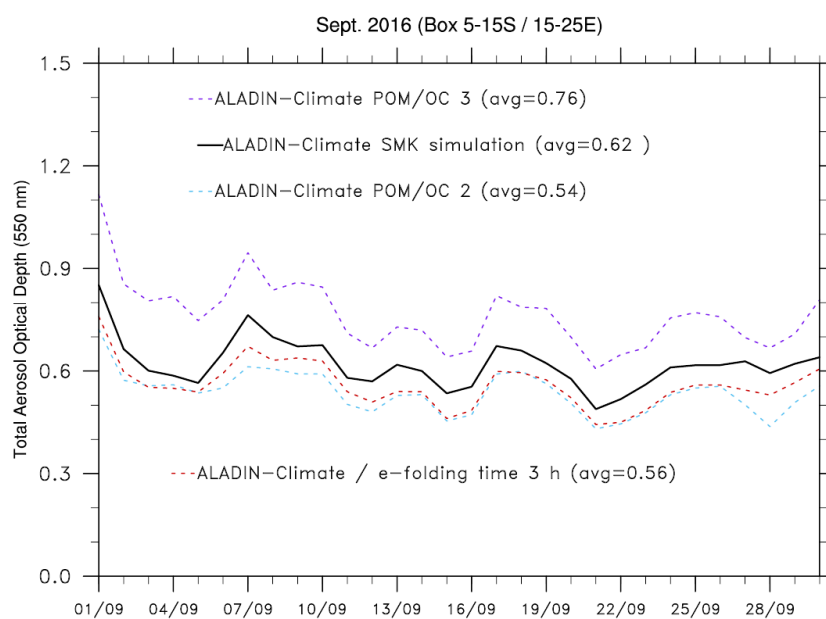**Figure S1.** Sensitivity tests on the POM to OC ratio and e-folding time used in the ALADIN-Climate model. Three additionnal simulations have been performed using a ratio of 2 and 3 and an e-folding time of 3h (Vakkari et al., 2018). The SMK simulation used a ratio of 2.3 (Formenti et al., 2003) and an e-folding time of 6h (Abel et al., 2003).
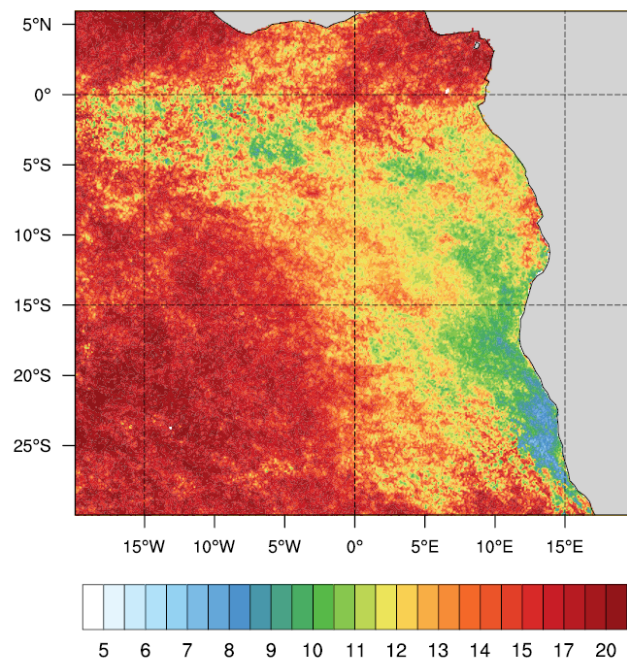
Figure S2. Monthly-mean CER (in µm) derived from the MODIS instrument for September 2016.

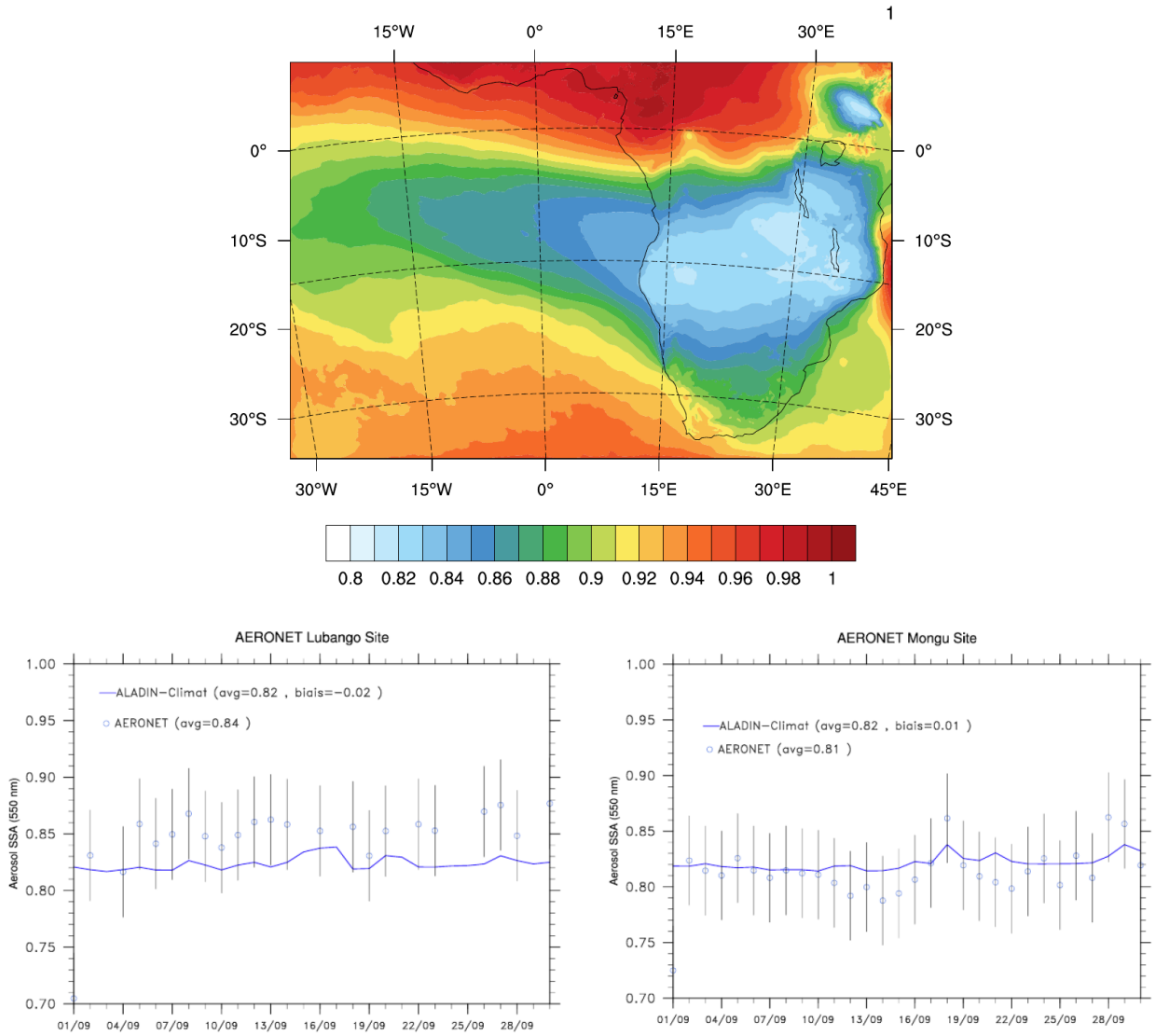ALADIN-Climat SSA (0.550 microm.) for September 2016

Figure S3. Monthly-mean SSA simulated by the ALADIN-Climate model (at 550 nm) for September 2016, integrated for the whole atmospheric column. AERONET and ALADIN-Climate daily-mean variability of the column-integrated SSA (550 nm) at two stations (Lubango (left bottom) and Mongu (right bottom)).
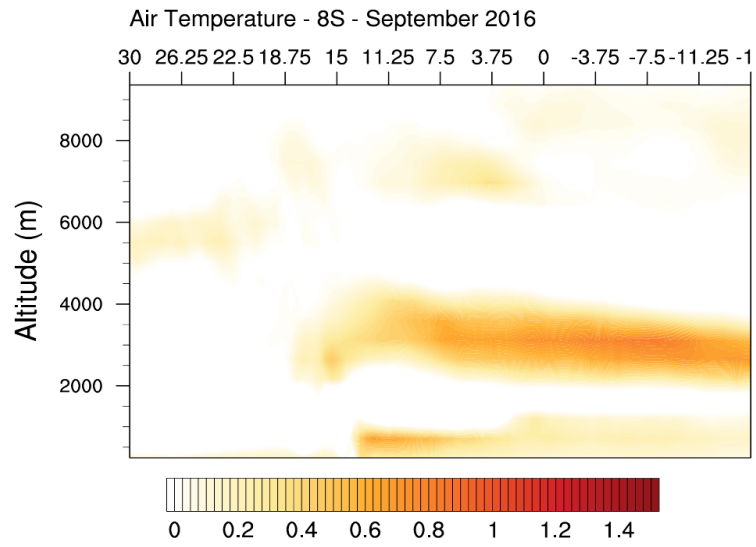
Figure S4. Difference in the air temperature (°C) between the SMK and CTL simulations and for the transect defined at a latitude of 8°S.
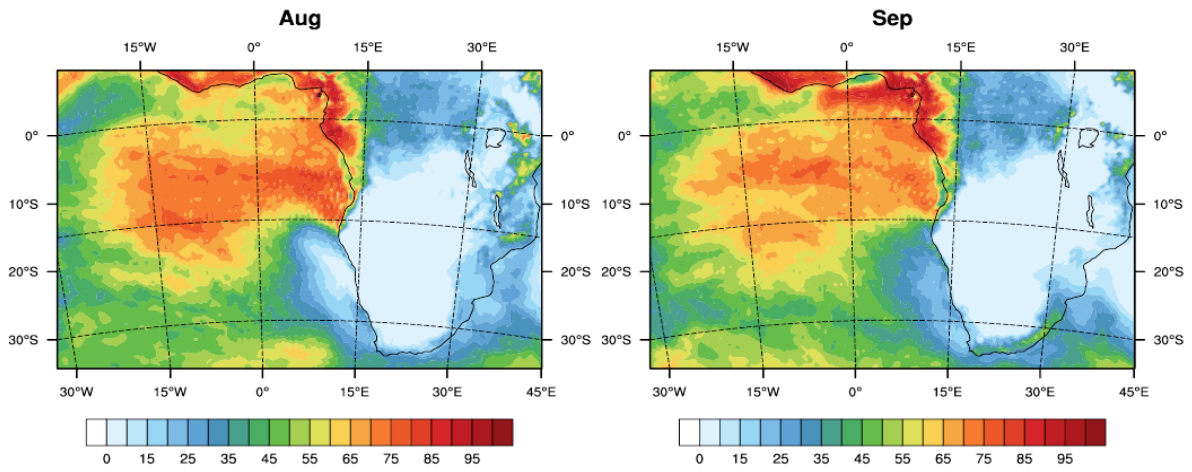
Figure S5. Monthly-mean Low Cloud Fraction (LCF) estimated by the ALADIN-Climate model for August and September 2016.
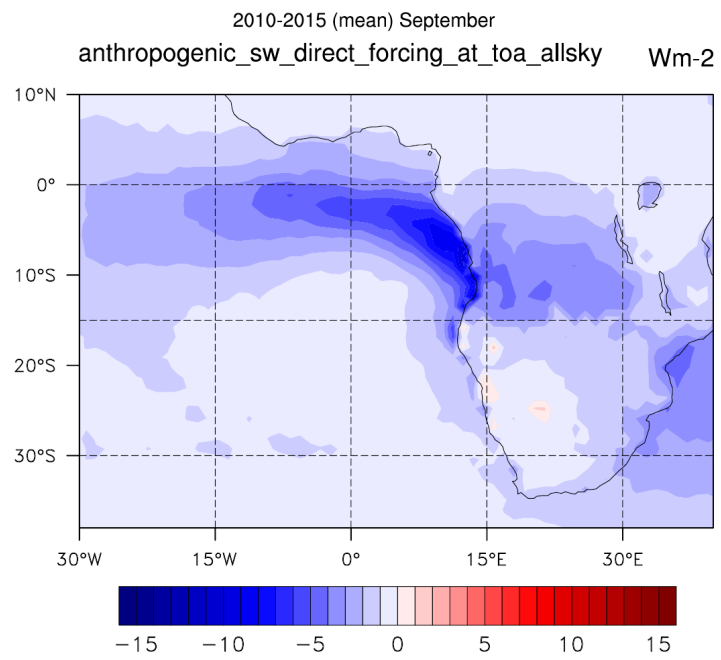
Figure S6. Monthly-mean (September) SW DRF (in all-sky conditions) estimated from the MACC NRT data, for the period 2000-2015.