

# ***Interactive comment on “Impact of Saharan dust on North Atlantic marine stratocumulus clouds: Importance of the semi-direct effect” by Anahita Amiri-Farahani et al.***

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There is no reference to papers by Kishcha et al. (2014, 2015) on significant cloud cover up to 0.8 – 0.9 (created by desert dust intrusions) along the Saharan Air Layer (SAL) in the tropical Atlantic.

In the Abstract, the authors (Amiri-Farahani et al., ACPD, 2016) highlight that: “Few observational studies have focused on dust-MSc interactions, thus this effect remains poorly quantified”. Unfortunately, the authors missed our publications on the topic (Kishcha et al., 2014; 2015). Based on MODIS cloud fraction data and NASA MER-R Aero aerosol reanalysis data during a 10-year period from July 2002 to June 2012, Kishcha et al. (2014, 2015) found that, in July, dust intrusions from the Sahara into

the tropical Atlantic contribute to significant cloud cover up to 0.8 – 0.9 along SAL. The area of SAL with significant CF is characterized by limited precipitation, indicating that clouds along the SAL are not developed enough. To explain the observed significant cloud cover up to 0.8 – 0.9 along SAL, Kishcha et al. (2015) suggested a plausible physical mechanism based on the indirect effect of Saharan dust on stratocumulus clouds below the temperature inversion under the base of SAL. Based on MODIS-derived effective radius of cloud droplets, Kishcha et al. (2015) quantitatively estimated that this radius increases with distance from the Sahara: from ~13.7 microns (at longitude ~27°W) to ~17.2 microns (at longitude ~48°W). This can be explained by the decrease in CCN numbers associated with the decreasing numbers of Saharan dust particles with distance from the Sahara.

References Kishcha P., da Silva A., Starobinets B., Long C.N., Kalashnikova O., Alpert P. (2014). Meridional distribution of aerosol optical thickness over the tropical Atlantic Ocean. *Atmospheric Chemistry and Physics Discussion* 14, 23309-23339, doi:10.5194/acpd-14-23309-2014.

Kishcha P., da Silva A., Starobinets B., Long C.N., Kalashnikova O., Alpert P. (2015). Saharan dust as a causal factor of hemispheric asymmetry in aerosols and cloud cover over the tropical Atlantic Ocean. *International Journal of Remote Sensing* 36, 3423-3445, doi: 10.1080/01431161.2015.1060646.

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