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Observation of absorbing aerosols above clouds over the south-east Atlantic Ocean from the geostationary satellite SEVIRI – Part 2: Comparison with MODIS and aircraft measurements from the CLARIFY-2017 field campaign

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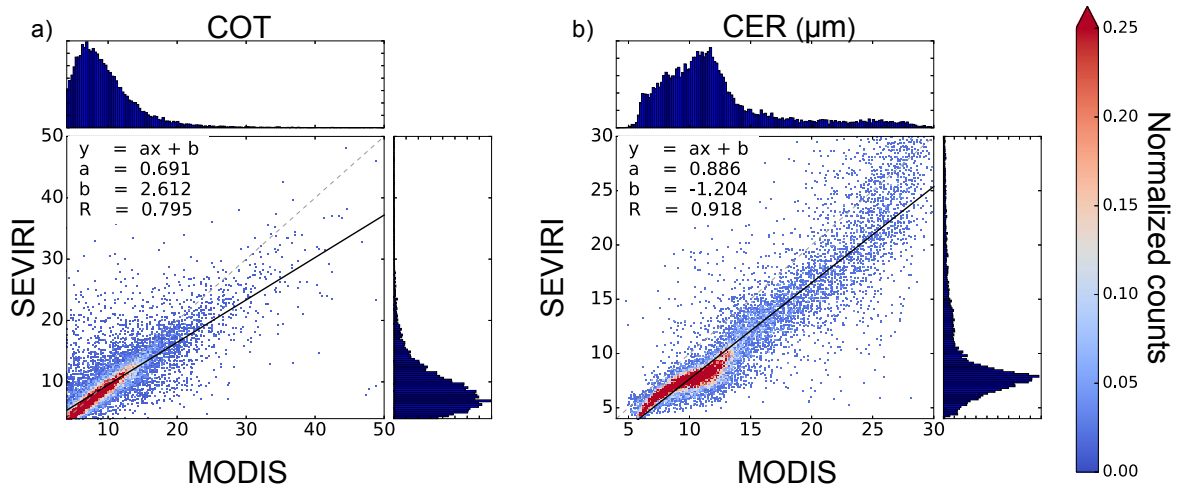

Figure S1: Scatterplots and data distributions for the comparison of the COT (a) and the CER (b) retrieved when the above-cloud AOT is lower than 0.05 by SEVIRI and MODIS (MOD06ACAERO) between the 28th August and 5th September 2017 over the area between 0°N - 30°S and 20°W - 15°E. The black lines represent the linear regression.*R* corresponds to the Pearson's correlation coefficient.

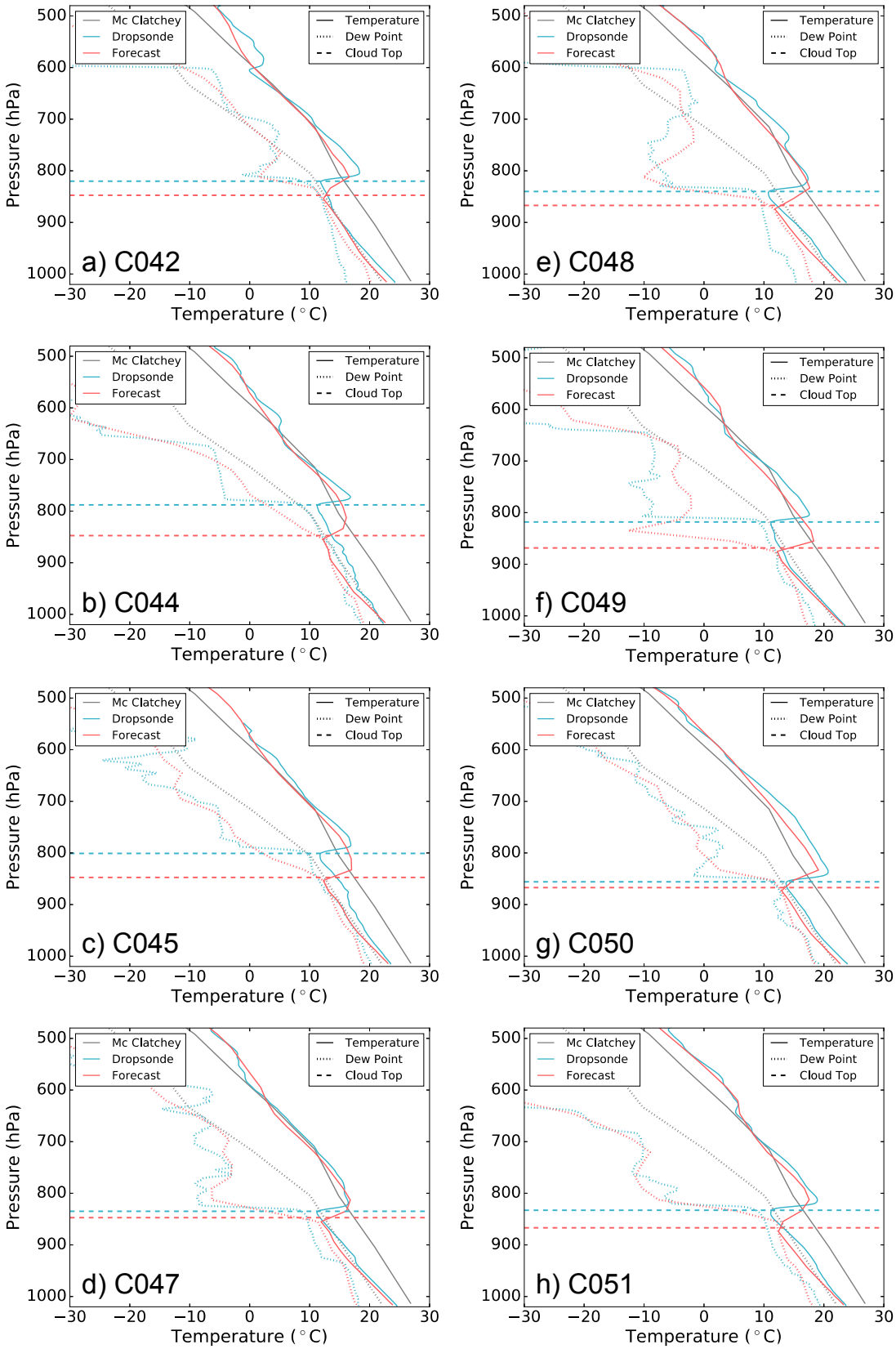

Figure S2: Temperature (solid lines) and dew point (dashed lines) profiles for eight flights from CLARIFY-2017 from dropsonde measurements (blue), from McClatchey's tropical atmospheric model (grey) and from the NWP forecast of the Met Office (red). For the dropsonde, the cloud top is considered to be at the temperature inversion and the cloud top associated with the forecast comes from the SEVIRI retrieval.

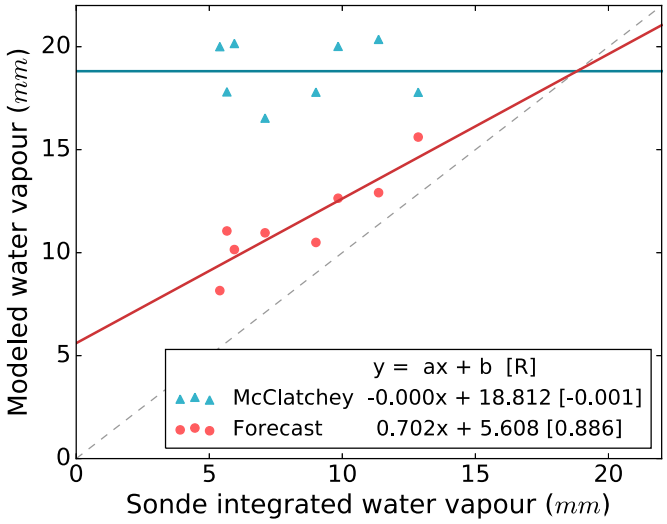

Figure S3: Comparison of the water vapour content integrated above clouds from the McClatchey's tropical atmospheric profile (blue) and from the forecast (red) with the measurements from the dropsondes during the CLARIFY-2017 campaign. The linear regression fits are defined by the slope *a*, the intercept *b* and the Pearson's correlation coefficient *R*.

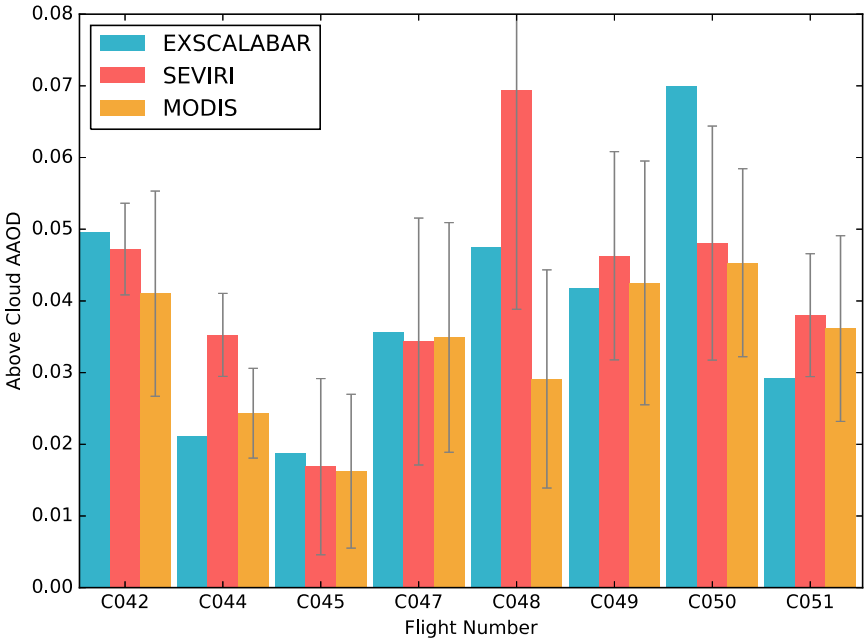

Figure S4: Comparison of the above-cloud Absorption AOT (AAOT) retrieved by SEVIRI and MODIS and measured by EXSCALABAR during descent profiles. The error bars represent the standard deviation of the SEVIRI and MODIS products within a 60 km radius around the aircraft measurements.

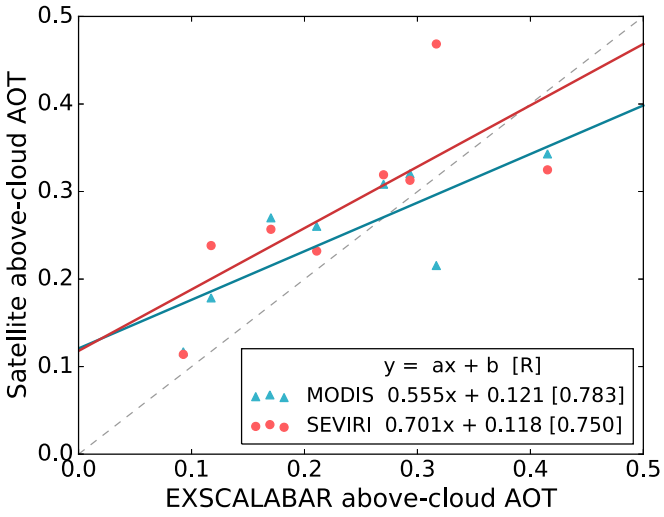

Figure S5: Comparison of the above-cloud AOT retrieved from MODIS (blue) and SEVIRI (red) with the measurements from EXSCALABAR during CLARIFY-2017.The linear regression fits are defined by the slope *a*, the intercept *b* and the Pearson's correlation coefficient *R*.

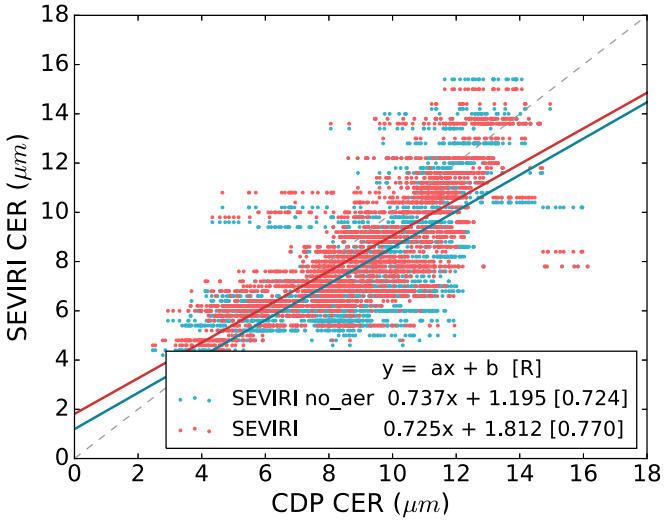

Figure S6: Comparison of the CER (µm) retrieved from SEVIRI with (red) and without taking into account aerosols above the clouds with the measurements from a CDP during CLARIFY-2017.The linear regression fits are defined by the slope *a*, the intercept *b* and the Pearson's correlation coefficient *R*.

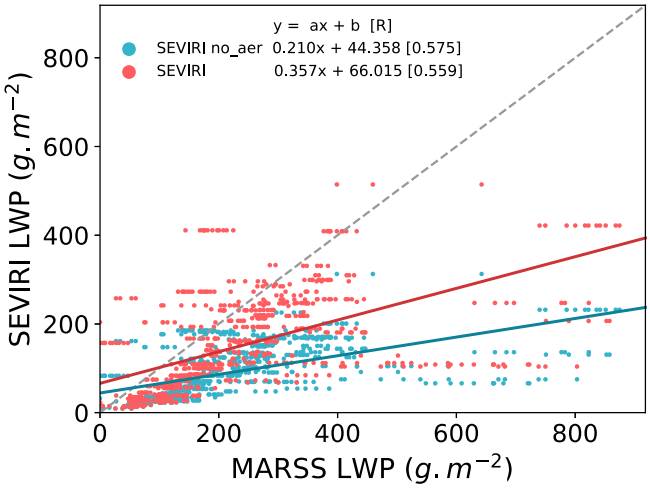

Figure S7: Comparison of the LWP derived from the SEVIRI cloud properties retrieved with (red) and without (blue) taking into account aerosols above clouds with the LWP retrieved from the MARSS measurements during CLARIFY-2017.The linear regression fits are defined by the slope *a*, the intercept *b* and the Pearson's correlation coefficient *R*.