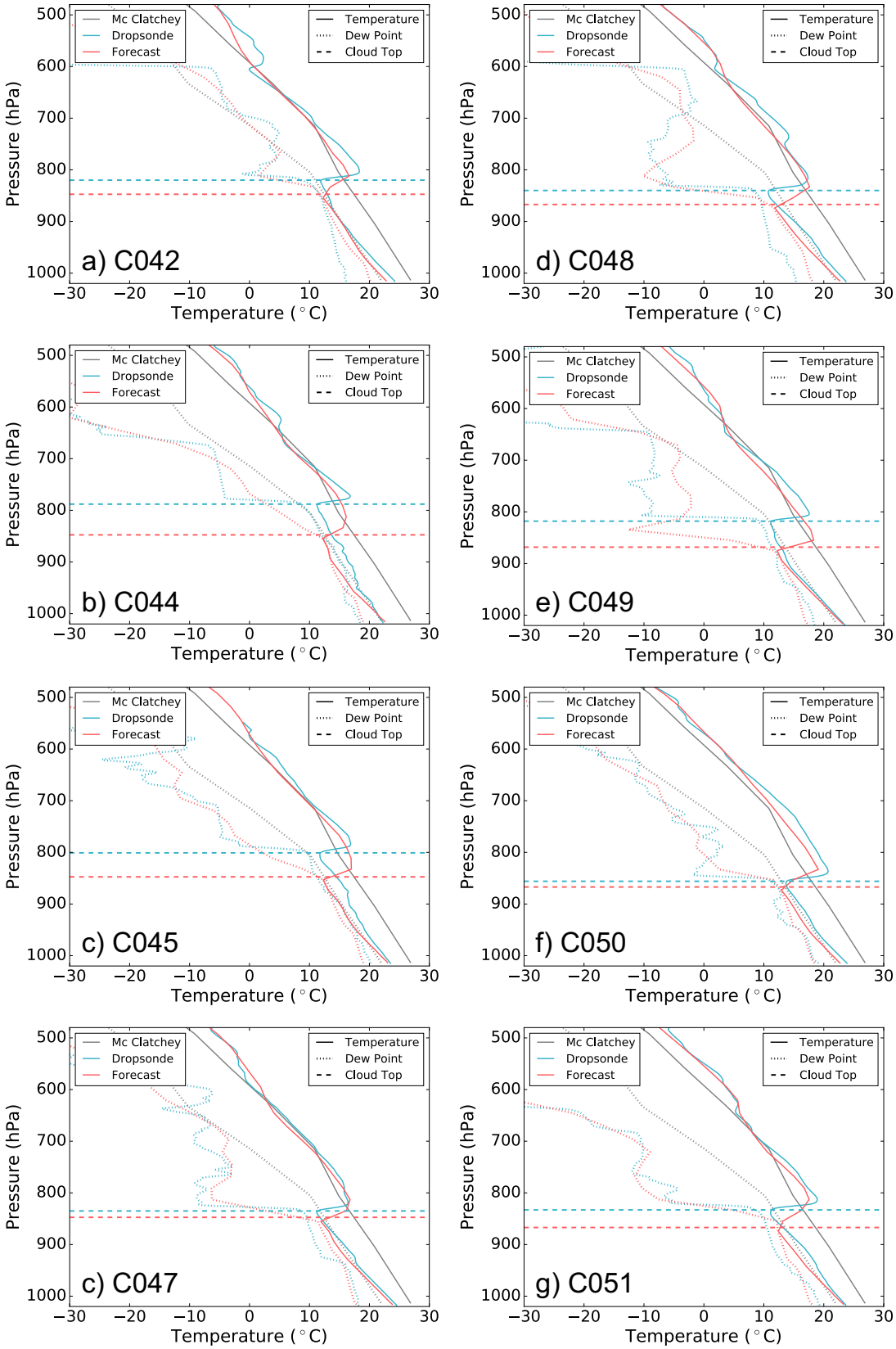

Figure S1: Temperature (solid lines) and dew point (dashed lines) profiles for eight flights from CLARIFY-2017 from dropsonde measurements (blue), from McClatchey's tropical atmospheric model (grey) and from the NWP forecast of the Met Office (red). For the dropsonde, the cloud top is considered to be at the temperature inversion and the cloud top associated with the forecast comes from the SEVIRI retrieval.

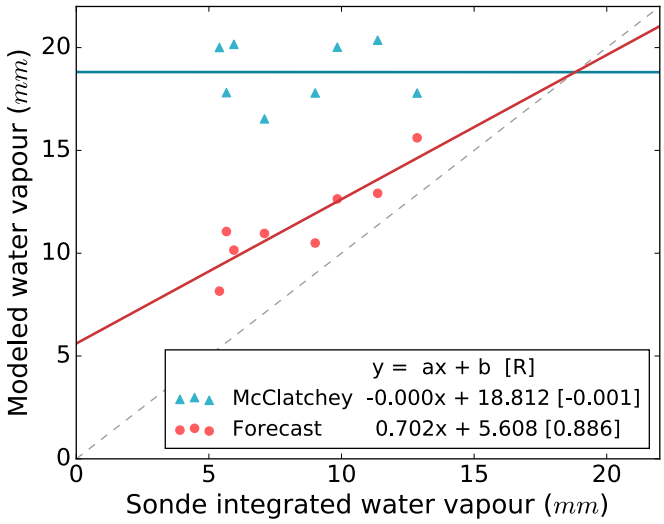

Figure S2: Comparison of the water vapour content integrated above clouds from the McClatchey's tropical atmospheric profile (blue) and from the forecast (red) with the measurements from the dropsondes during the CLARIFY-2017 campaign.

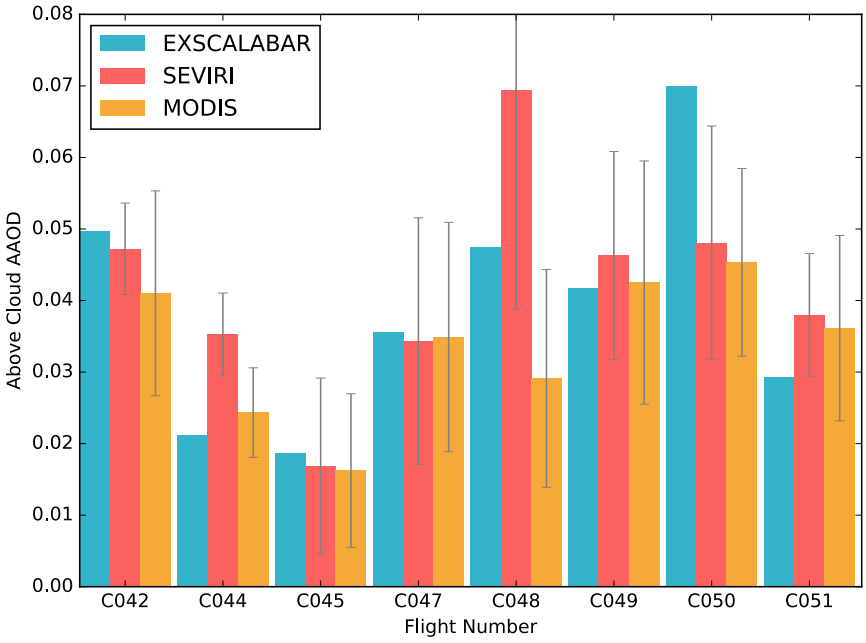

Figure S3: Comparison of the above-cloud Absorption AOT (AAOT) retrieved by SEVIRI and MODIS and measured by EXSCALABAR during descent profiles. The error bars represent the standard deviation of the SEVIRI and MODIS products within a 60 km radius around the aircraft measurements.

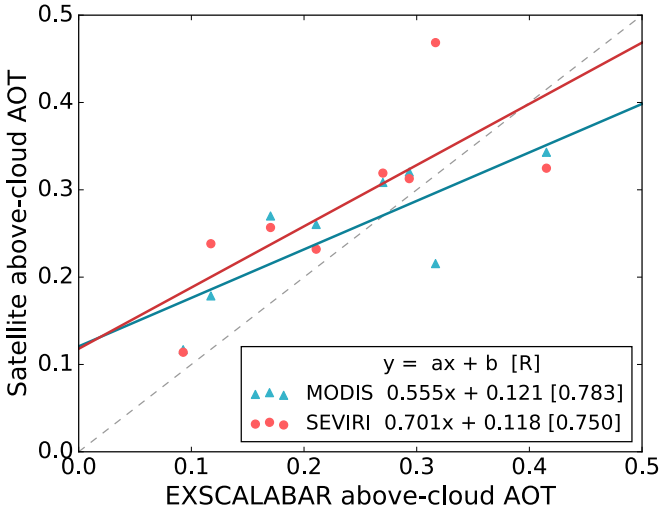

Figure S4: Comparison of the above-cloud AOT retrieved from MODIS (blue) and SEVIRI (red) with the measurements from EXSCALABAR during CLARIFY-2017.

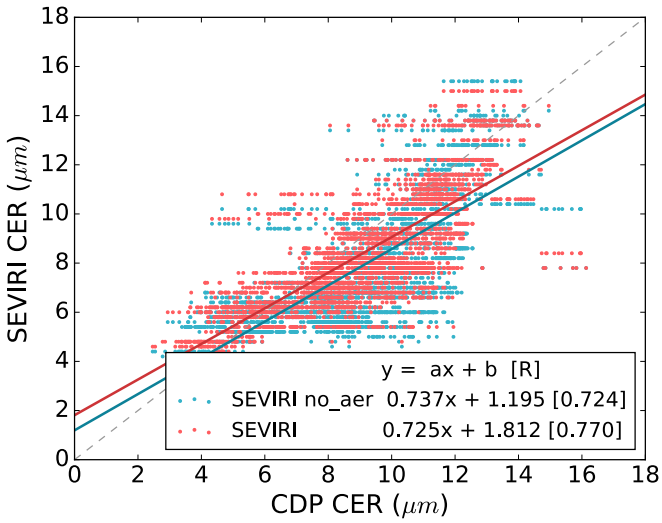

Figure S5: Comparison of the CER (µm) retrieved from SEVIRI with (red) and without taking into account aerosols above the clouds with the measurements from a CDP during CLARIFY-2017.

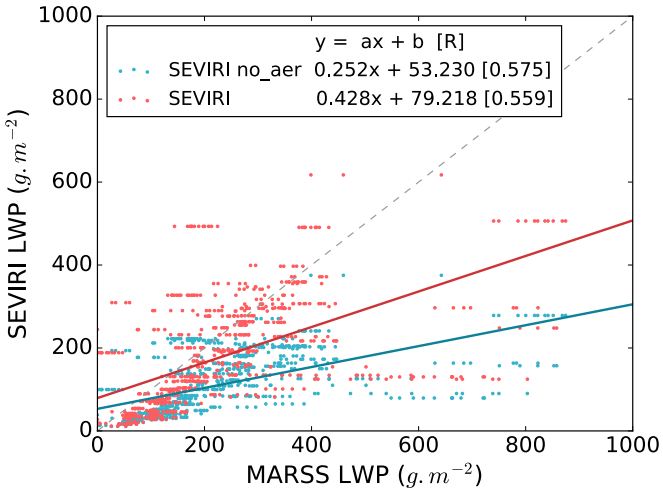

Figure S6: Comparison of the LWP derived from the SEVIRI cloud properties retrieved with (red) and without (blue) taking into account aerosols above clouds with the LWP retrieved from the MARSS measurements during CLARIFY-2017.