



Supplement of

Evaluation of the CMIP6 marine subtropical stratocumulus cloud albedo and its controlling factors

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3 Figure S1: Long-term mean cloud fraction and estimated cloud albedo from the 29 AMIP6 models and

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⁴ satellite observations during 2003-2014.





Figure S2: Monthly mean time series of correlation coefficient between cloud fraction and planetary albedo 7 (a-e) from AMIP5 and AMIP6 multimodel ensemble mean during 2003-2008, and (f-j) from AMIP6

8 multimodel ensemble mean during 2003-2014 compared with satellite observations, over the (a, f) Peruvian,



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Figure S3: Annual cycles of the estimated cloud albedo and LWP from satellite observations during 2003-2014 over the (a) Peruvian, (b) Namibian, (c) Californian, (d) Australian, (e) Canarian regions. The temporal correlations (R value) and P value (if P<0.10, indicating the correlation R is significant) between cloud albedo and LWP are given in parentheses.



19 Figure S4: The probability density functions (PDF) of (a) cloud albedo, (b) LWP, (c-h) log10 mass





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Figure S5: The (a) regression coefficients and corresponding (b) relative contribution of each predictor variables relating to cloud albedo from the multilinear regression models under two MAC-LWP conditions: $LWP \le 55 \text{ gm}^{-2}$ (blue) and 55 g m⁻² < LWP $\le 120 \text{ gm}^{-2}$ (yellow). Note that for ease of comparison, eight variables are given in the figure, variables without values are not predictive variables of the sample group. And the satellite- and model-driven normalized cloud albedo trained in two sample groups: (c) LWP $\le 55 \text{ gm}^{-2}$ < LWP $\le 120 \text{ gm}^{-2}$. The correlations (R value) between satellite- and model-driven normalized cloud albedo are given in parentheses.

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31 Figure S6: Similar to Figure S6, but for ERA-5 and two MODIS LWP conditions: LWP \leq 65 g m⁻² (blue)



32 and 65 g $m^{-2} < LWP \le 120$ g m^{-2} (yellow).

34 Figure S7: Monthly mean time series of estimated cloud albedo, correlation coefficient between cloud



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