



Supplement of

The role of tropical upwelling in explaining discrepancies between recent modeled and observed lower-stratospheric ozone trends

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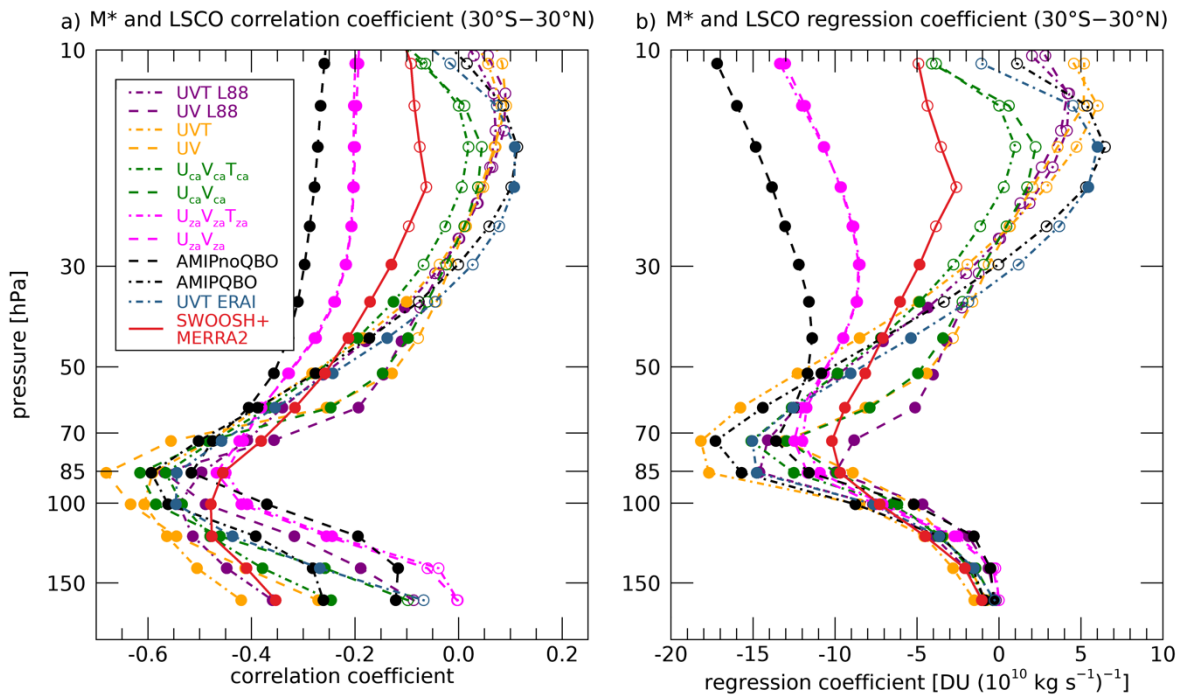


Figure S1: Same as Fig. 4, but for lower stratospheric column ozone computed over 30°S to 30°N .

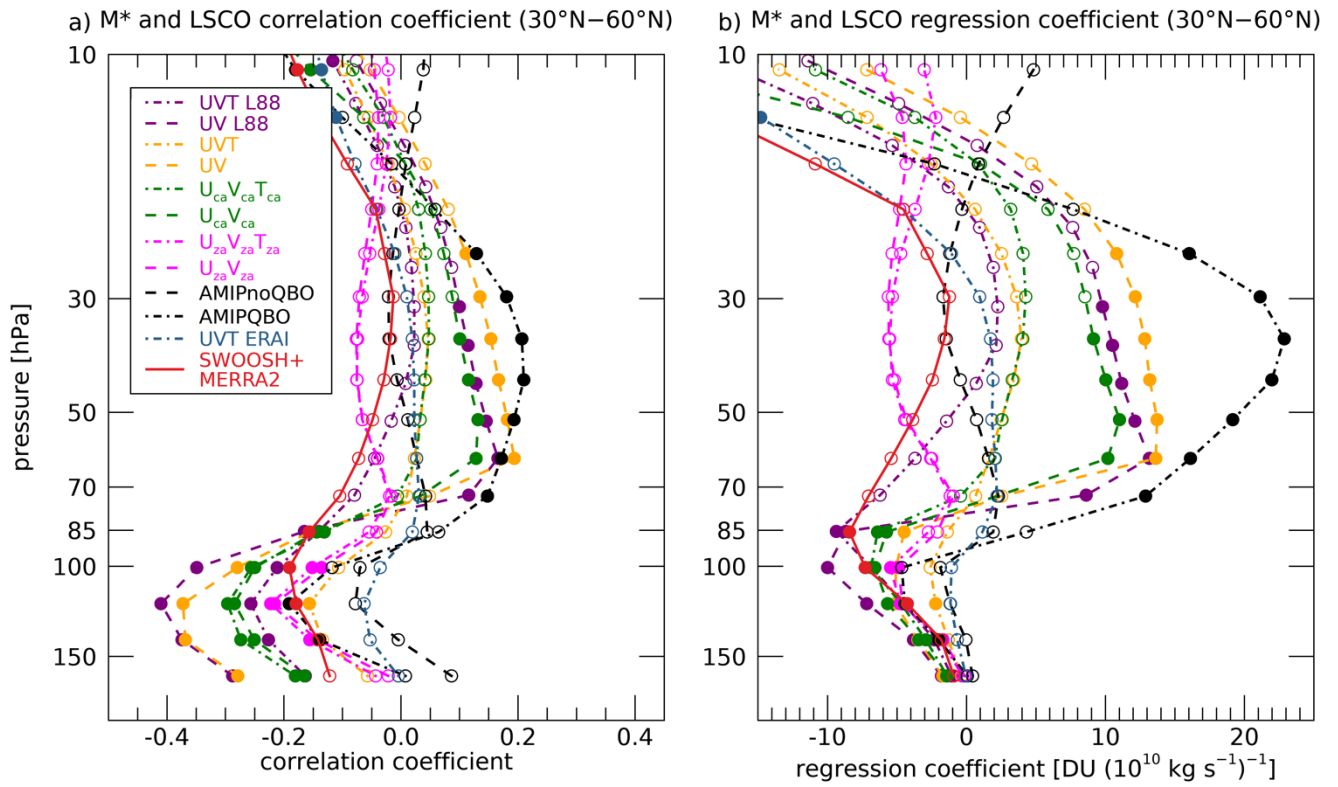
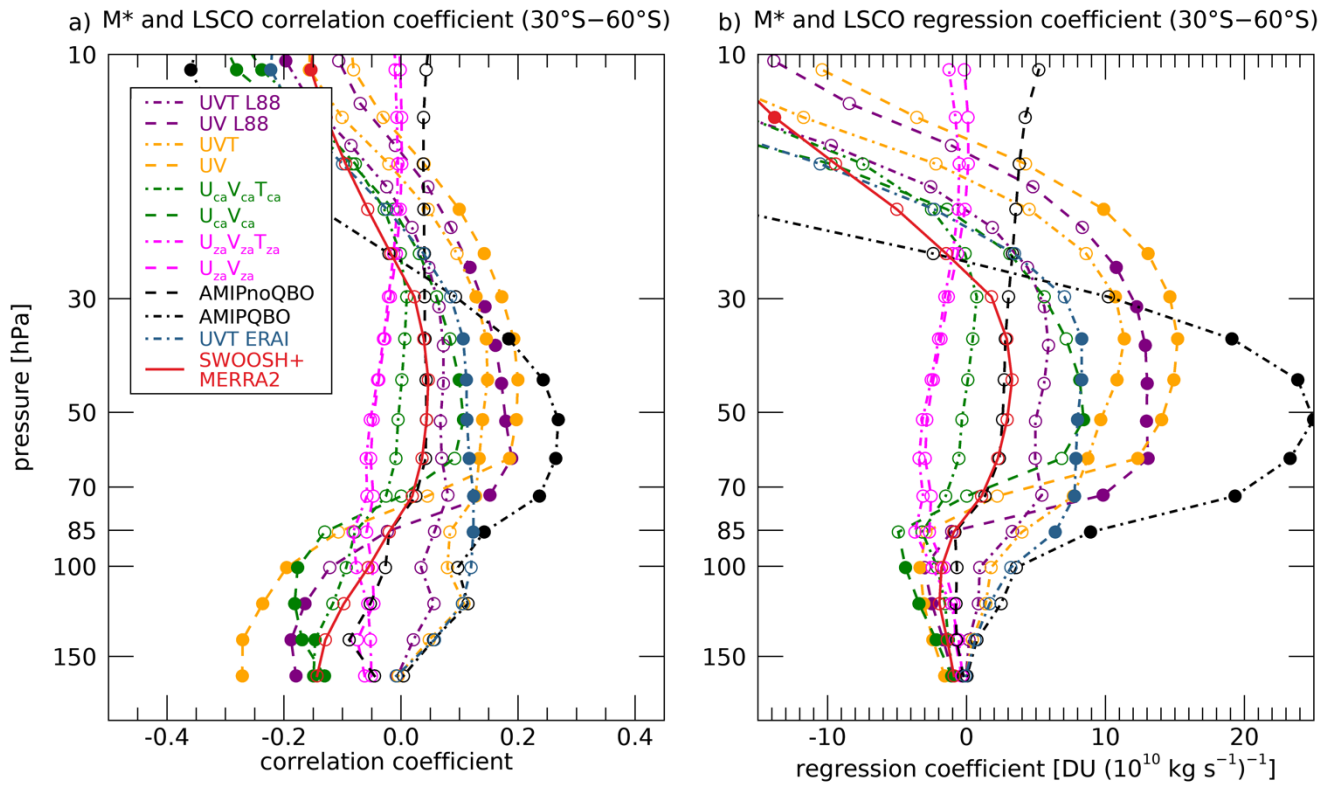


Figure S2: Same as Fig. 4 and, but for lower stratospheric column ozone averaged over 30°N to 60°N.



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Figure S3: Same as Fig. 4, but for lower stratospheric column ozone computed over 30°S to 60°S.

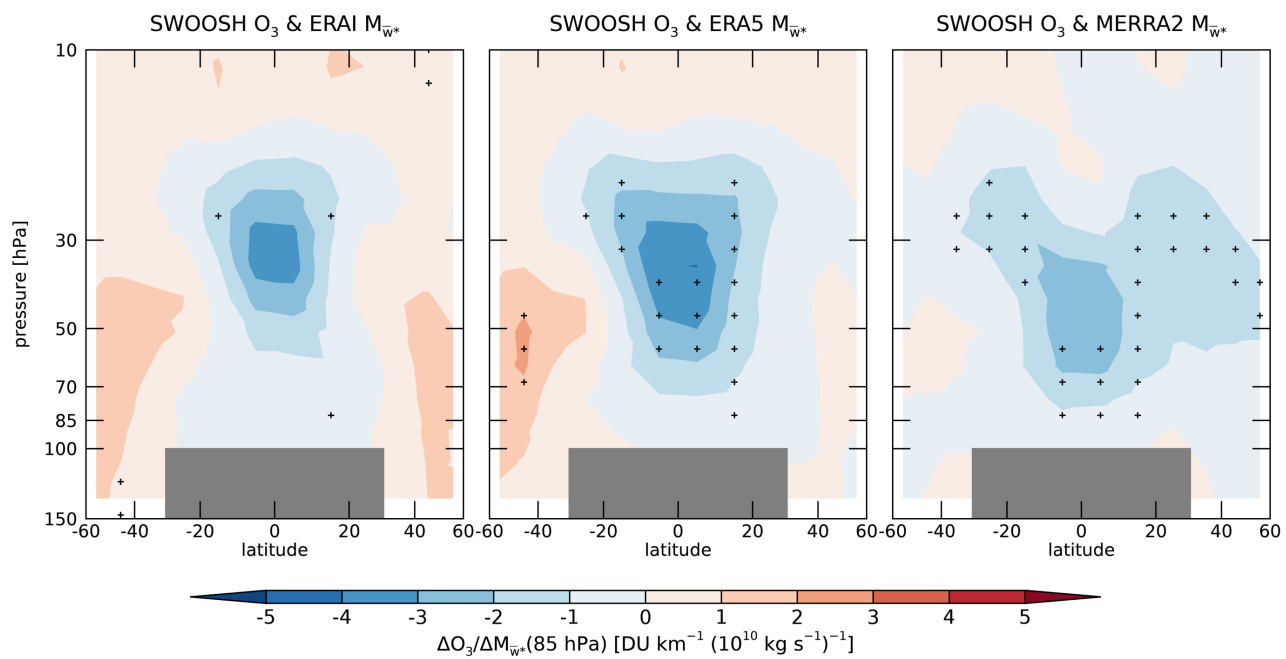


Figure S4: As in Fig. 5, but including all reanalyses.

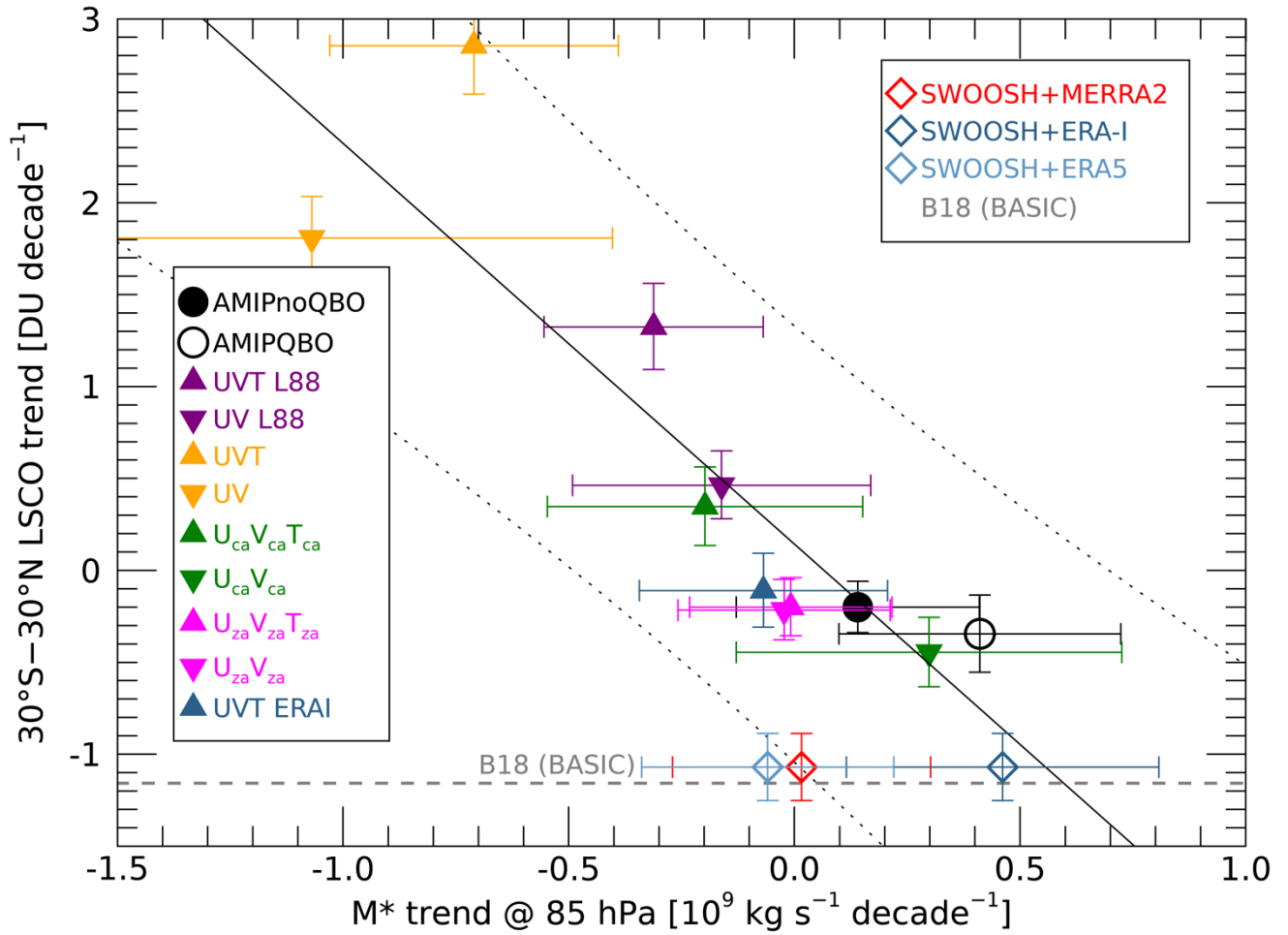
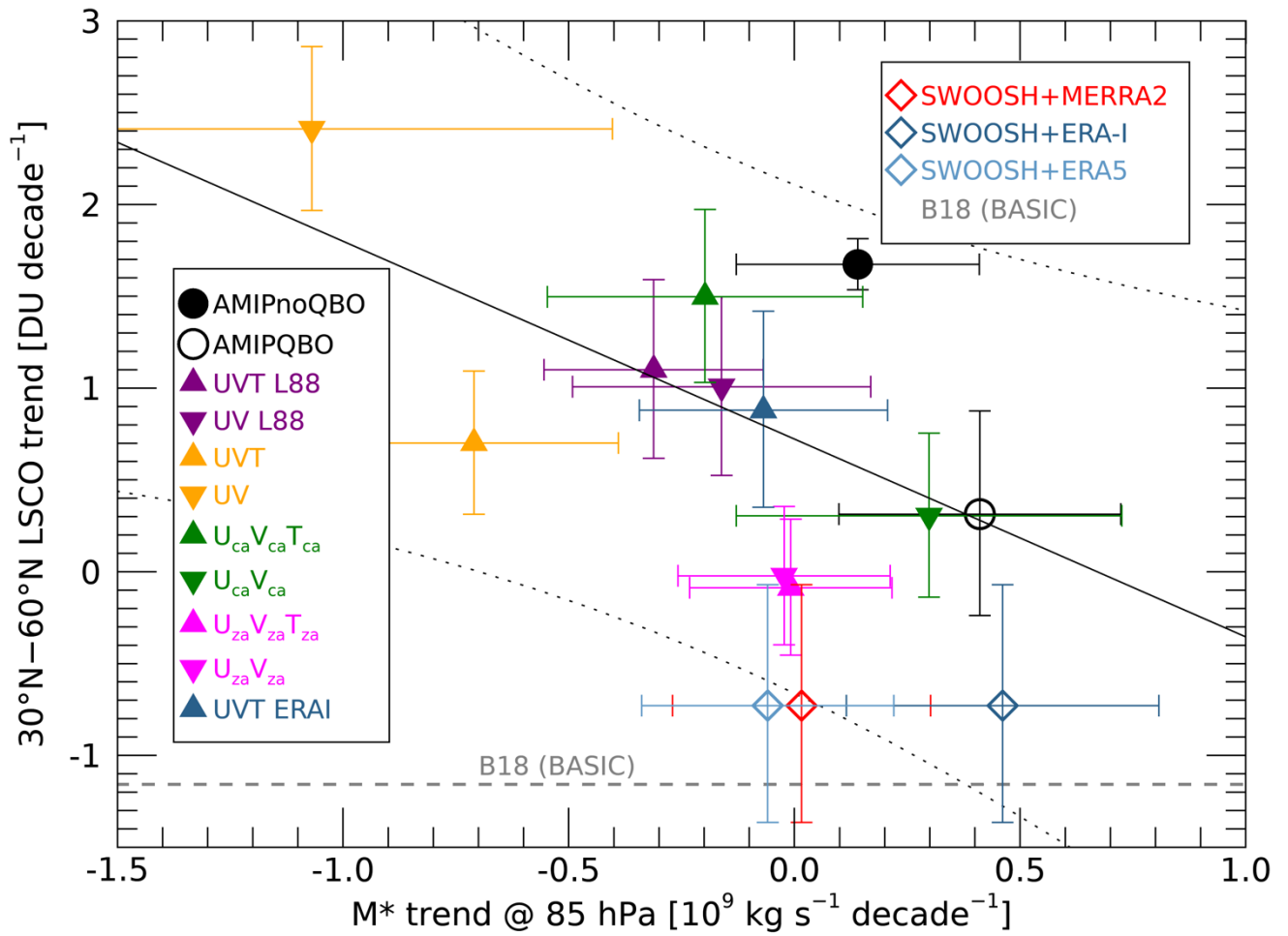


Figure S5: As in Fig. 6, but for the tropics ($30^{\circ}\text{S} - 30^{\circ}\text{N}$).



15 Figure S6: As in Fig. 6, but for the NH midlatitudes ($30^{\circ}\text{N} - 60^{\circ}\text{N}$).

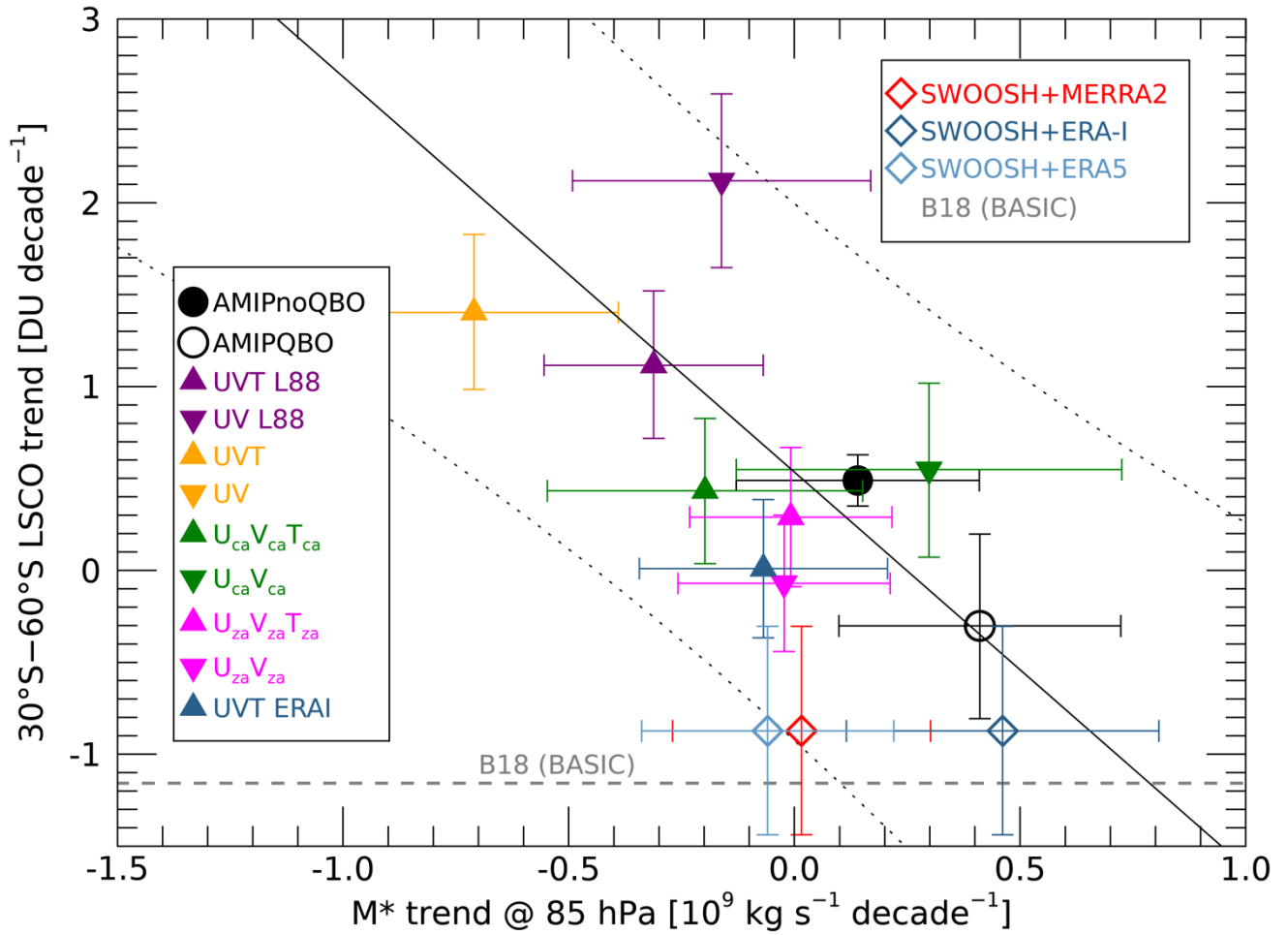
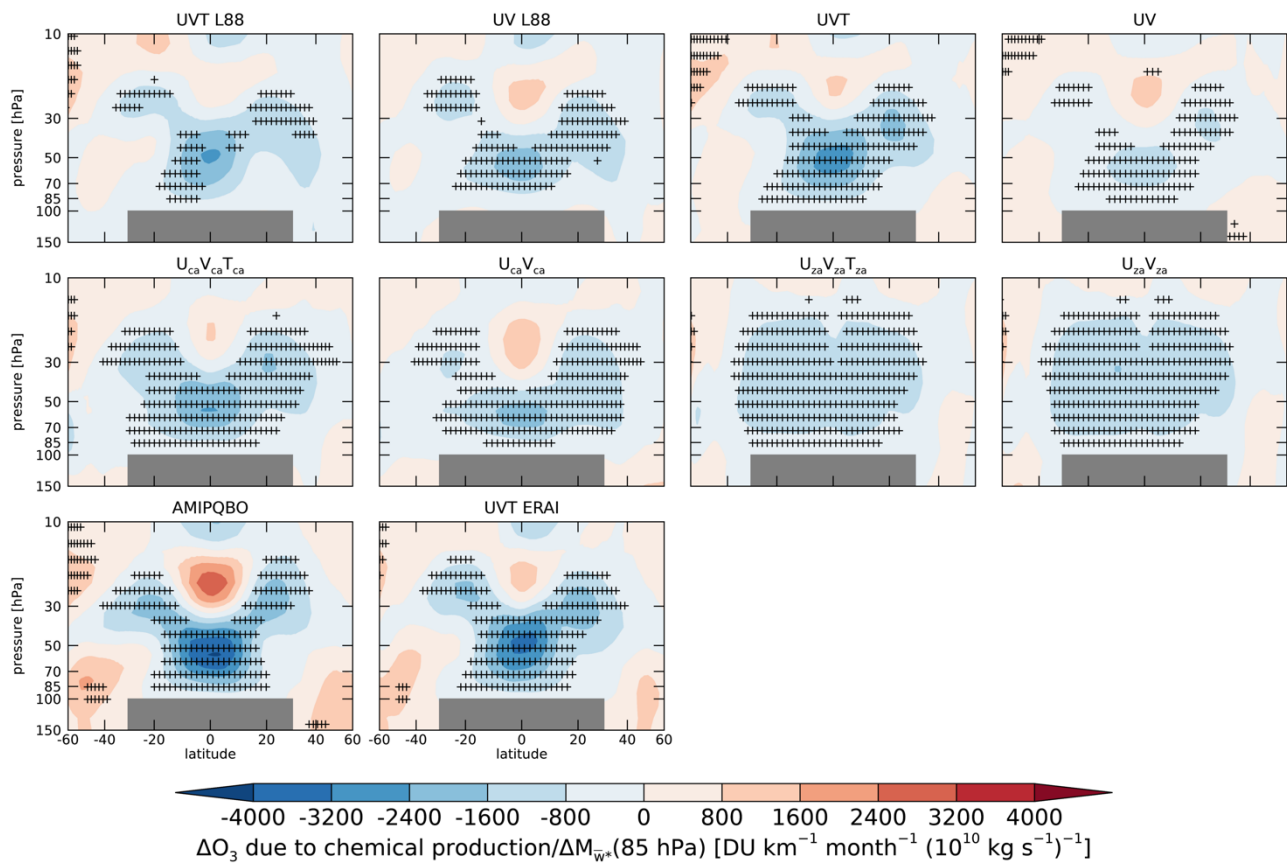
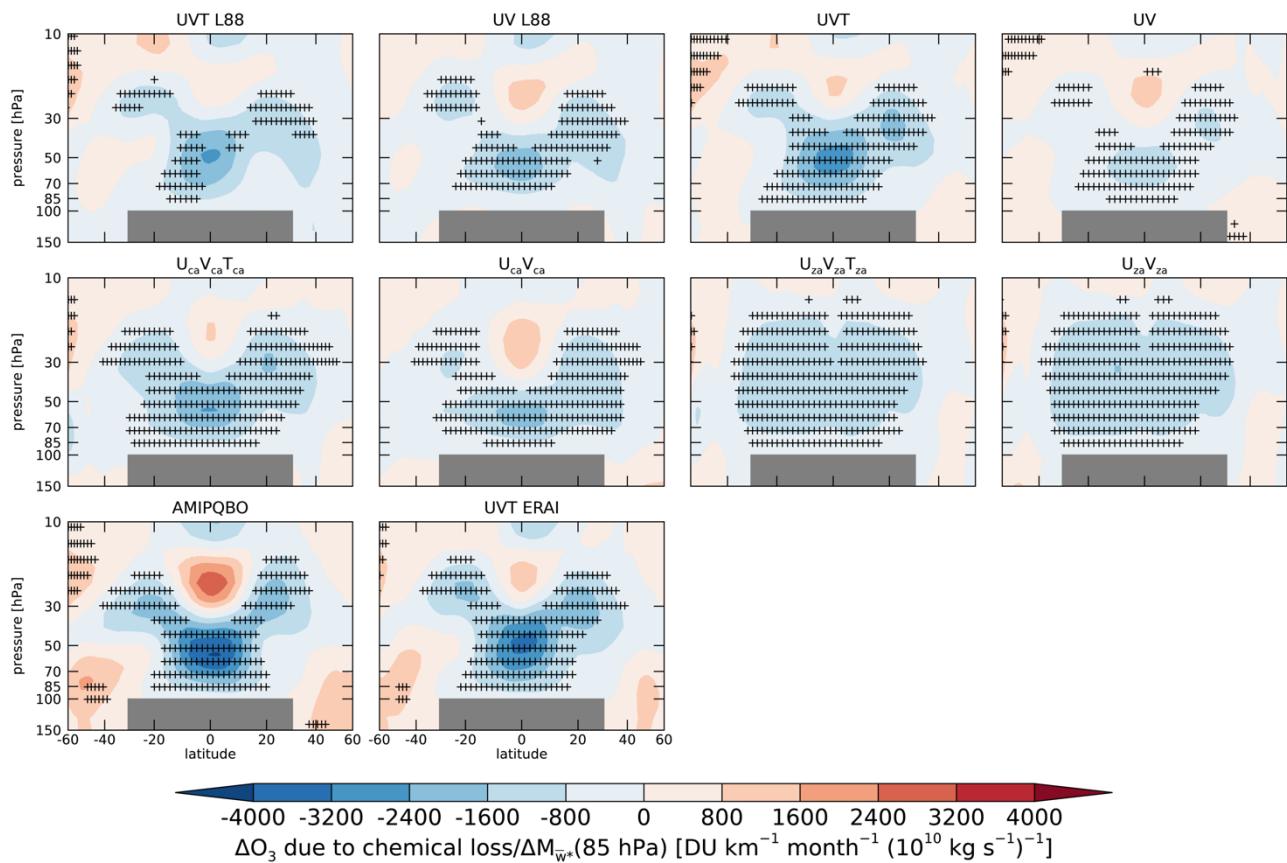


Figure S7: As in Fig. 6, but for the SH midlatitudes (30°S – 60°S).



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Figure S8: As in Fig. 9, but for the ozone tendency due to chemical production. Note that the scale in this figure is a factor of 800 broader than for the net term in Fig. 9, as ozone net production is in general the difference between two large numbers.



25 **Figure S9:** As in Fig. 9, but for the ozone tendency due to chemical loss. Note that the scale in this figure is a factor of 800 broader than for the net term in Fig. 9, as ozone net production is in general the difference between two large numbers.