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Diurnal variation of tropospheric humidity in tropical region

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1 RH Spatial Distribution

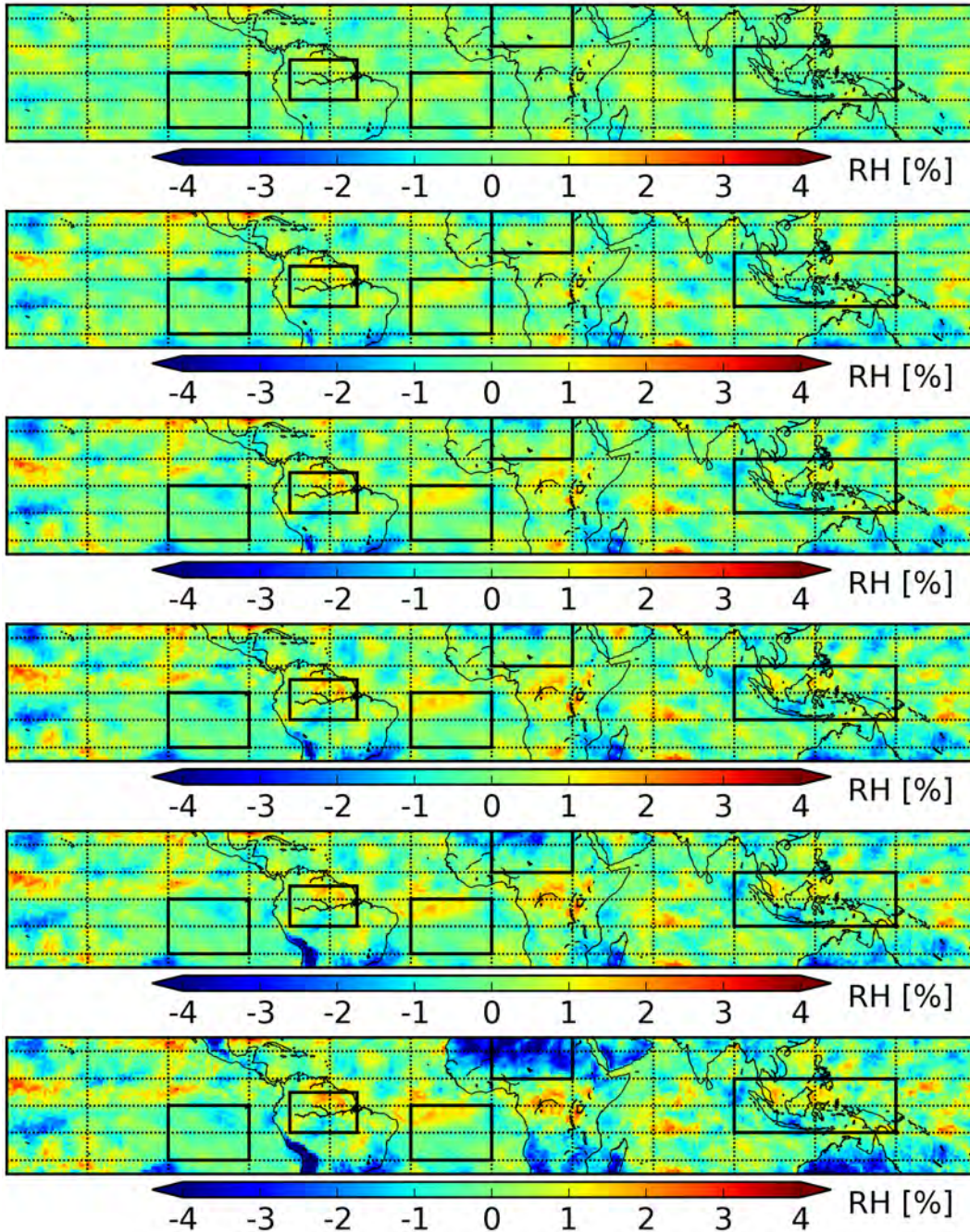


Figure 1. Mean difference of daily average of RH_L calculated using only data from 01:30/13:30 local time and the daily average calculated using all hourly data. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

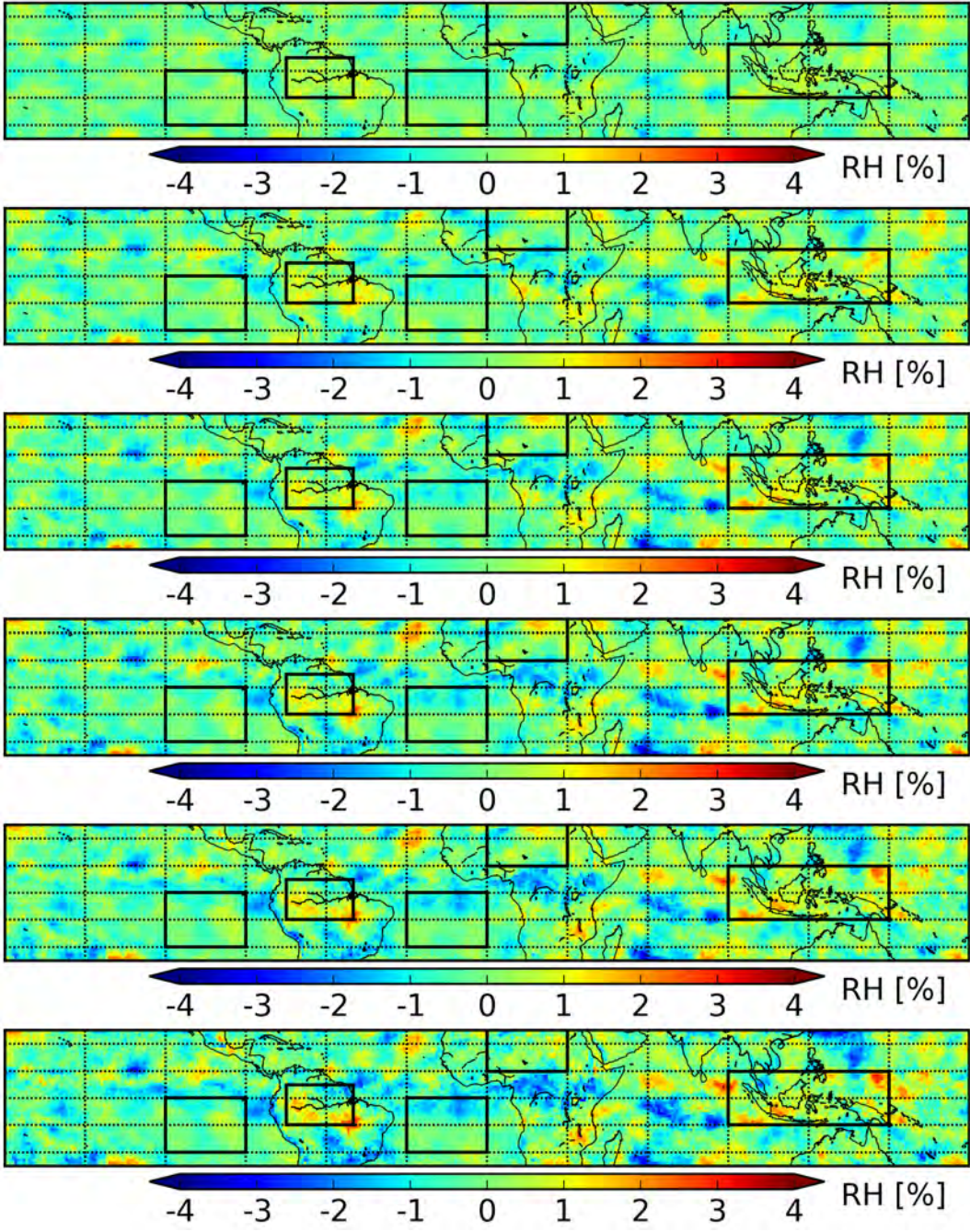


Figure 2. Mean difference of daily average of RH_L calculated using only data from 09:30/21:30 local time and the daily average calculated using all hourly data. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

2 RH Peak and Amplitudes (Measurements)

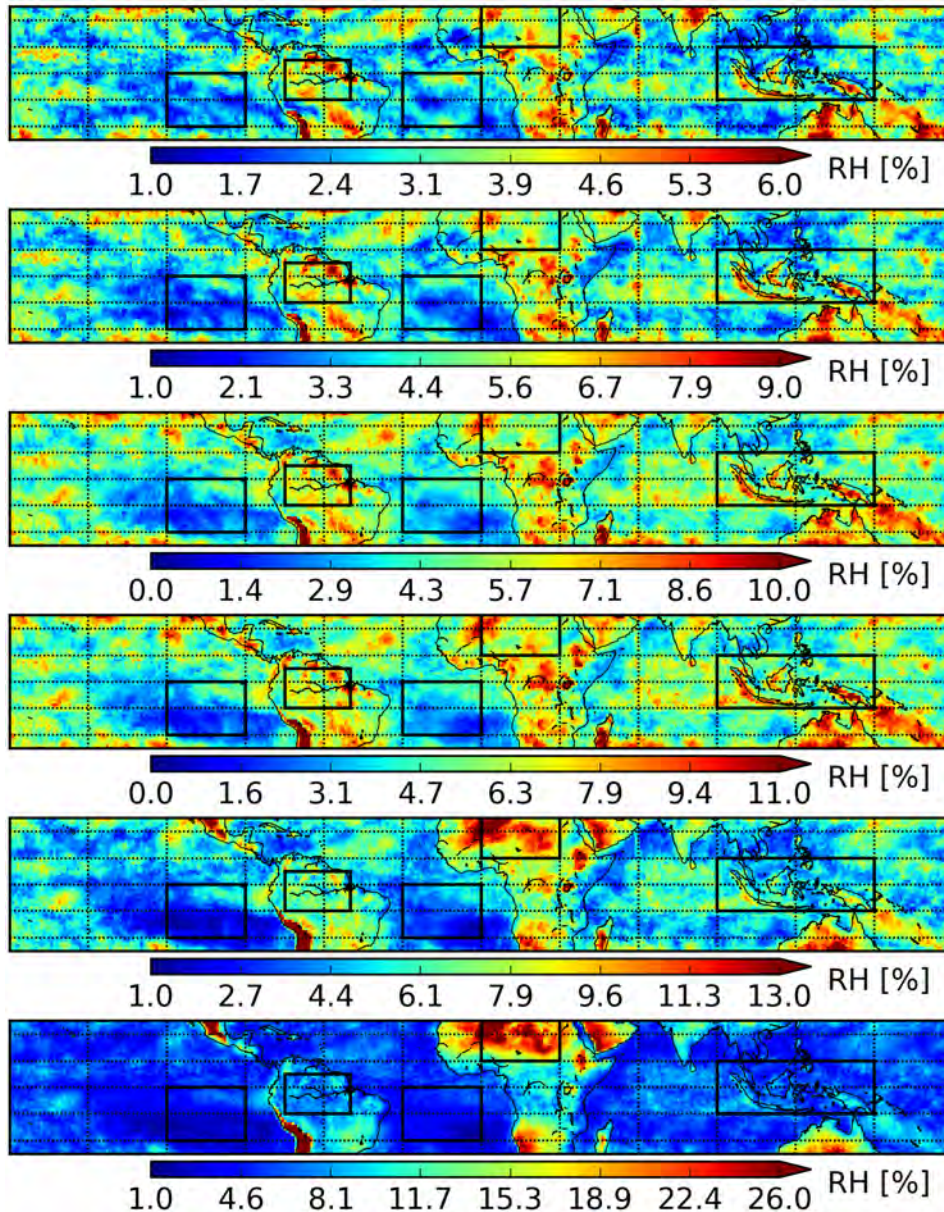


Figure 3. Spatial distribution of diurnal amplitude of tropospheric humidity over liquid (based on measurements). Plots from top to bottom are for SAPHIR channels 1-6, respectively.

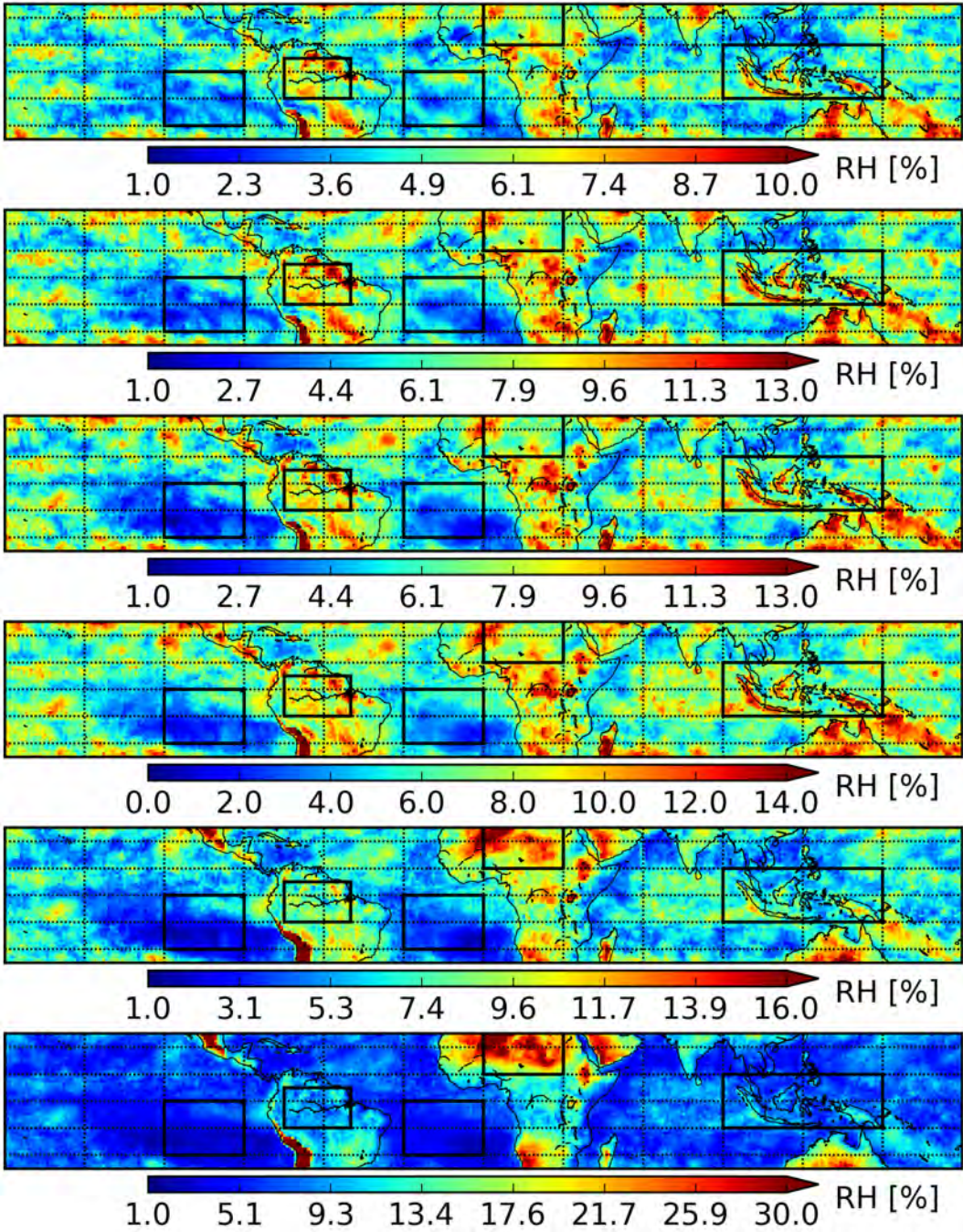


Figure 4. Spatial distribution of diurnal amplitude of tropospheric humidity over ice (based on measurements). Plots from top to bottom are for SAPHIR channels 1-6, respectively.

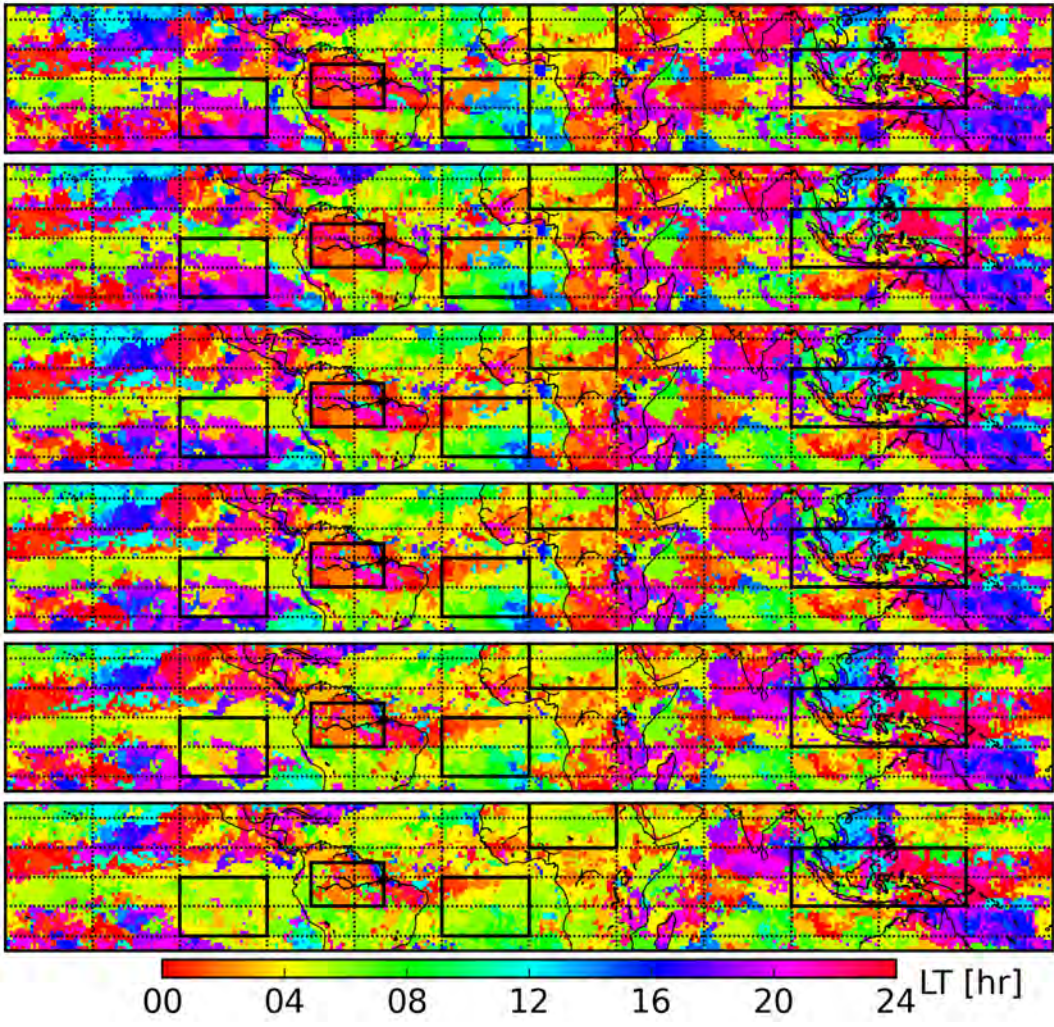


Figure 5. Diurnal peak time (based on measurements with respect to liquid) for upper to lower tropospheric channels (SAPHIR channels 1-6 from top to bottom) in local time.

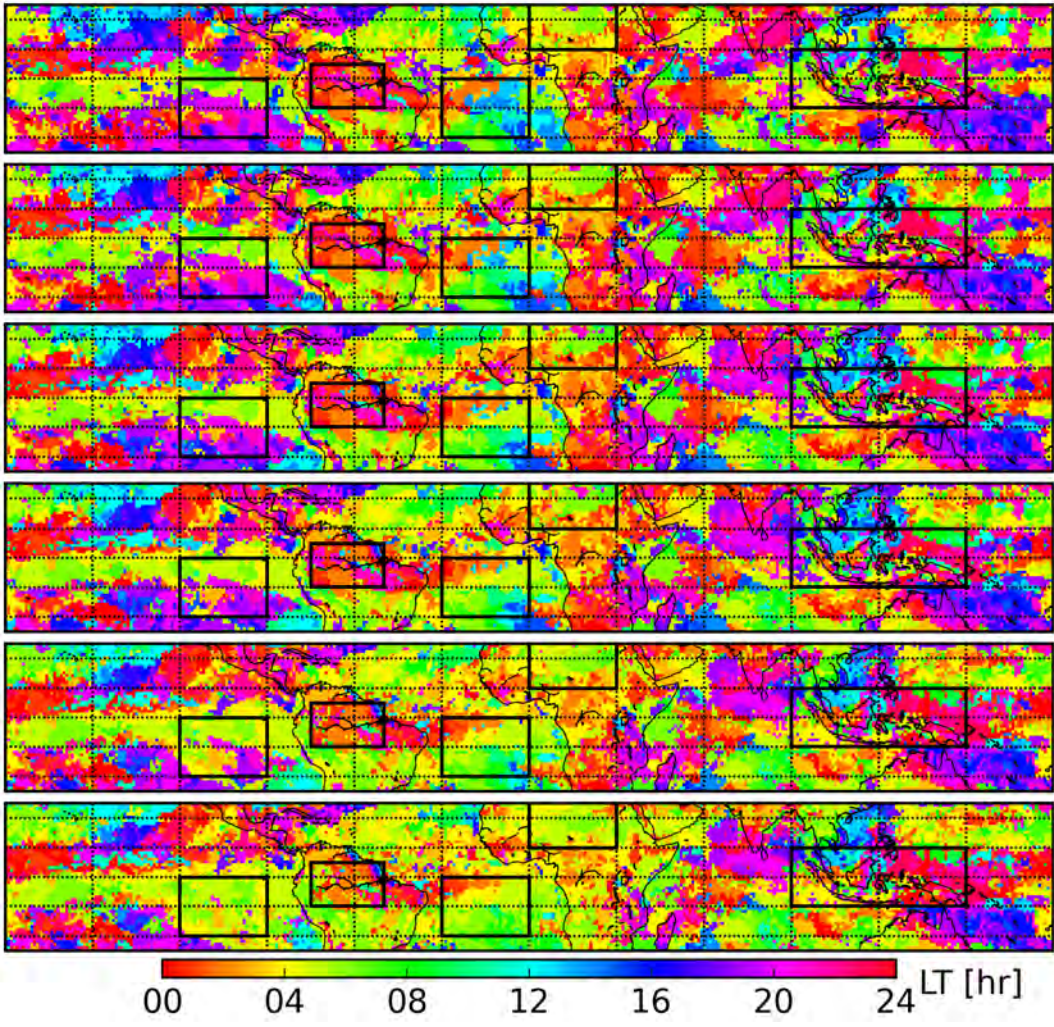


Figure 6. Diurnal peak time (based on measurements with respect to ice) for upper to lower tropospheric channels (SAPHIR channels 1-6 from top to bottom) in local time.

3 RH Peak and Amplitudes Derived From Fourier Series

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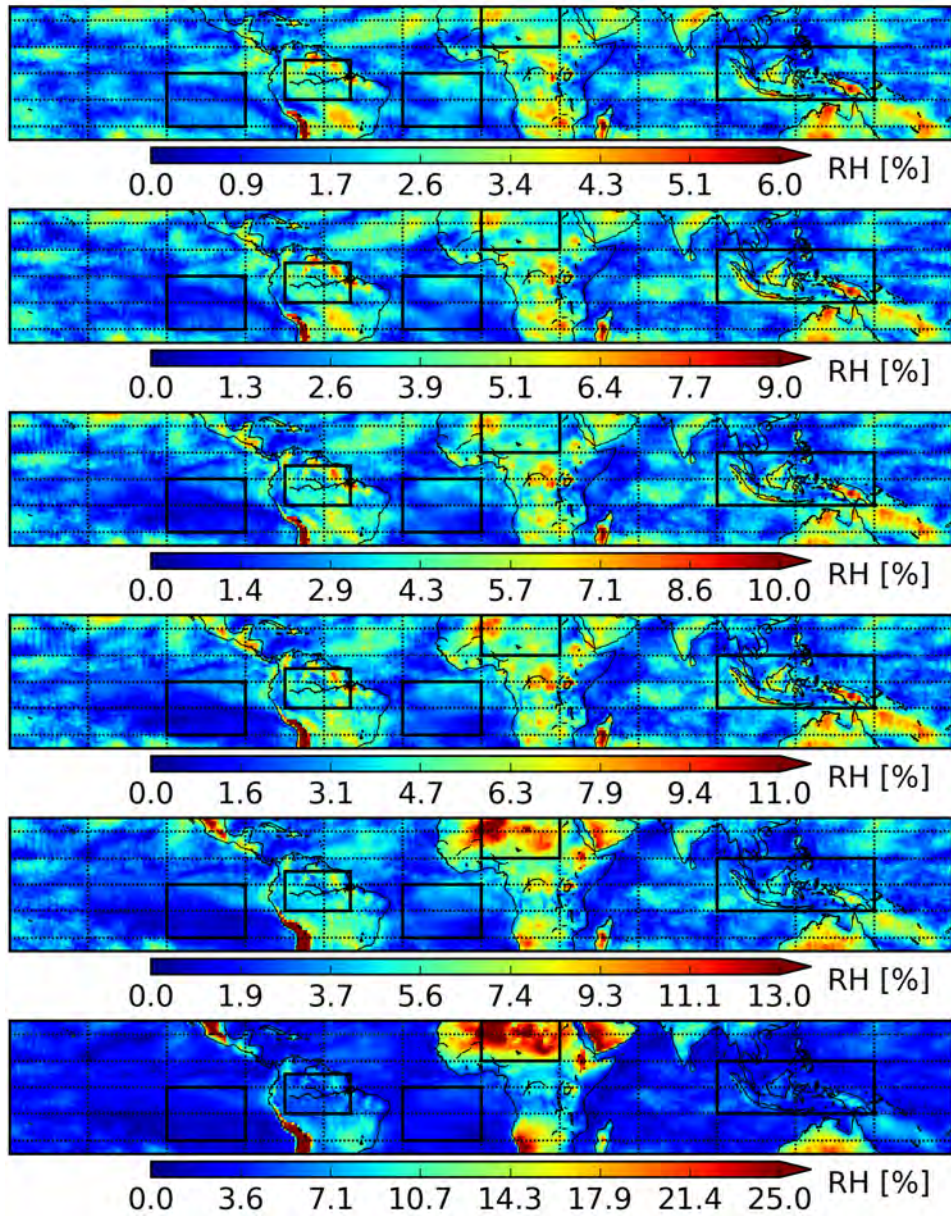


Figure 7. Spatial distribution of diurnal amplitude of tropospheric humidity over liquid (based on the Fourier series fit). Plots from top to bottom are for SAPHIR channels 1-6, respectively.

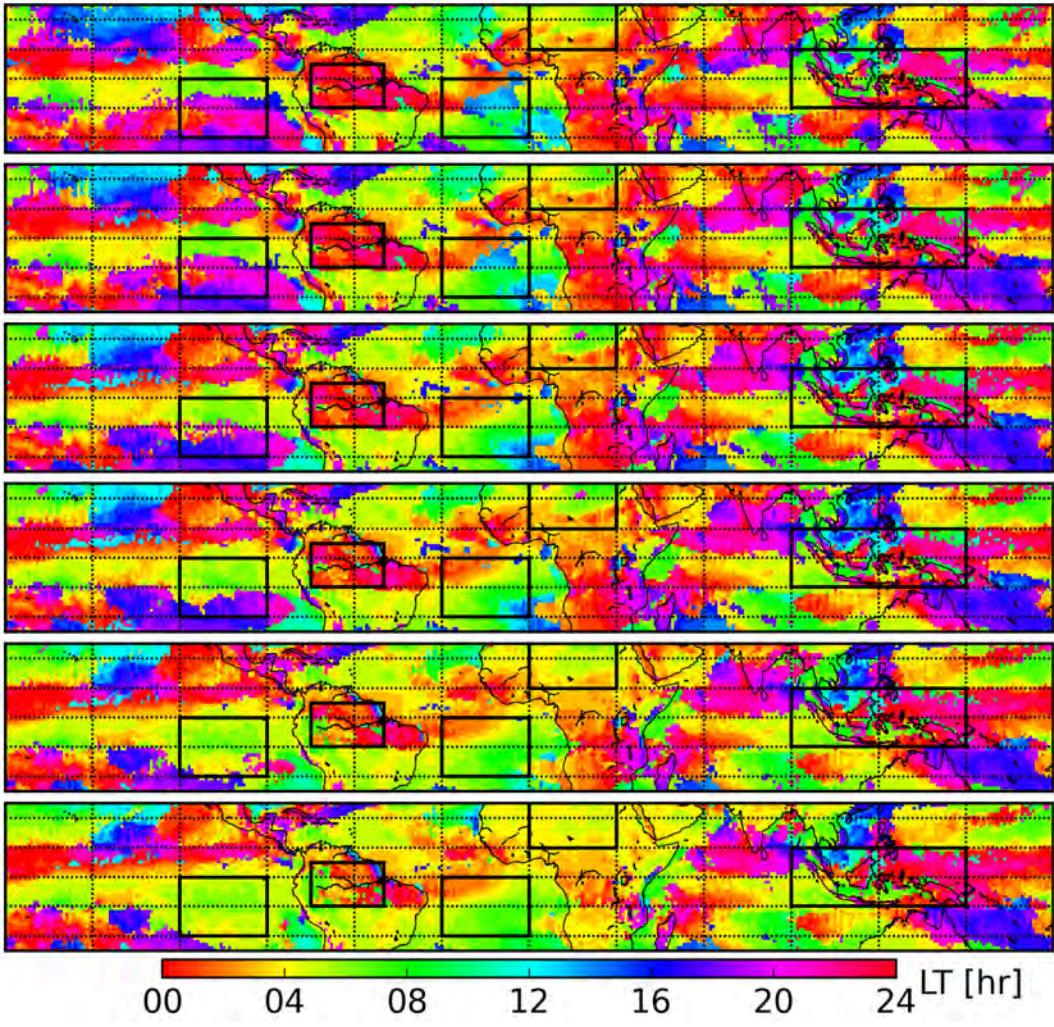


Figure 8. Diurnal peak time (with respect to liquid and based on Fourier series fit) in local time. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

4 Fourier Series

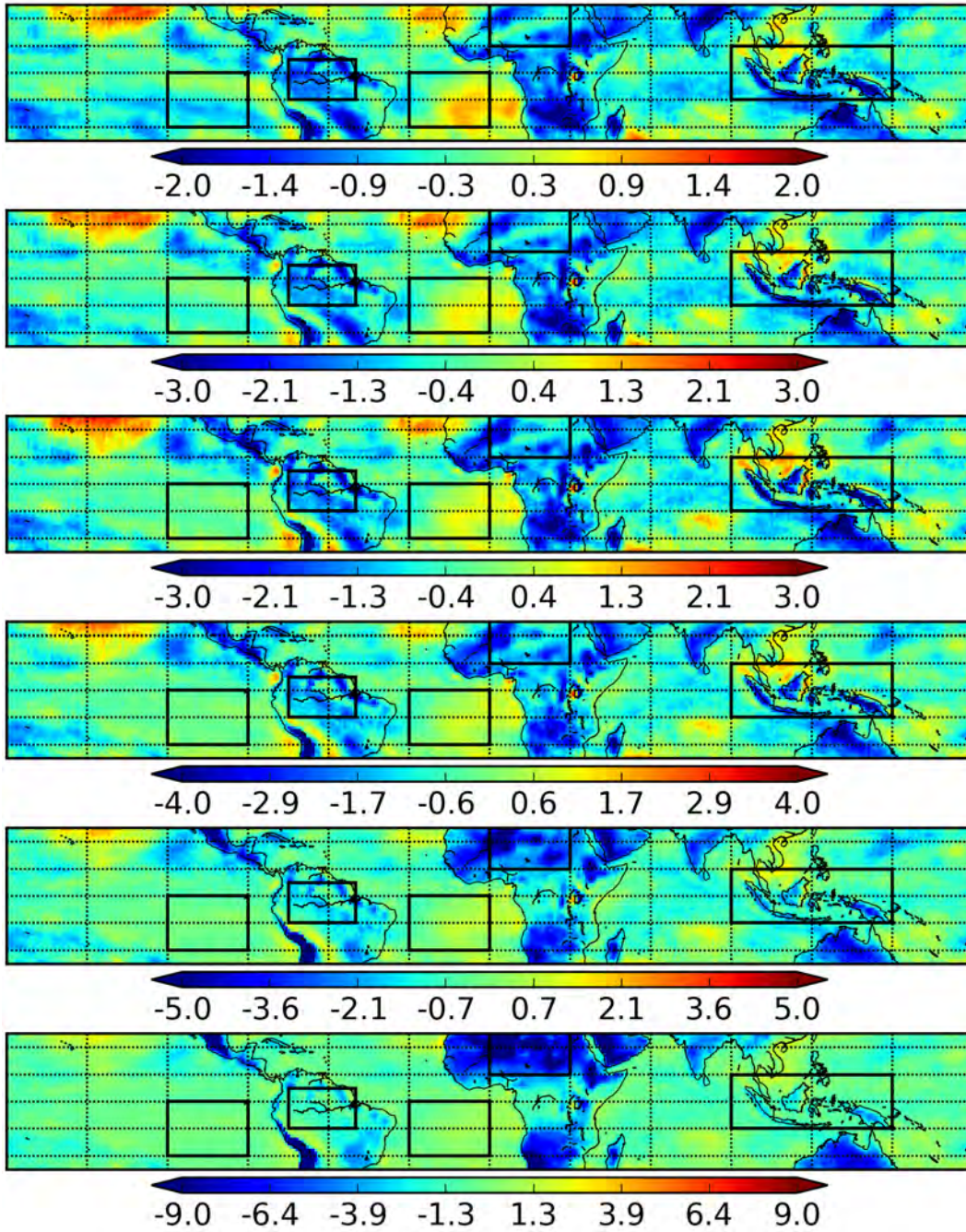


Figure 9. The coefficient a_1 (with respect to liquid) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

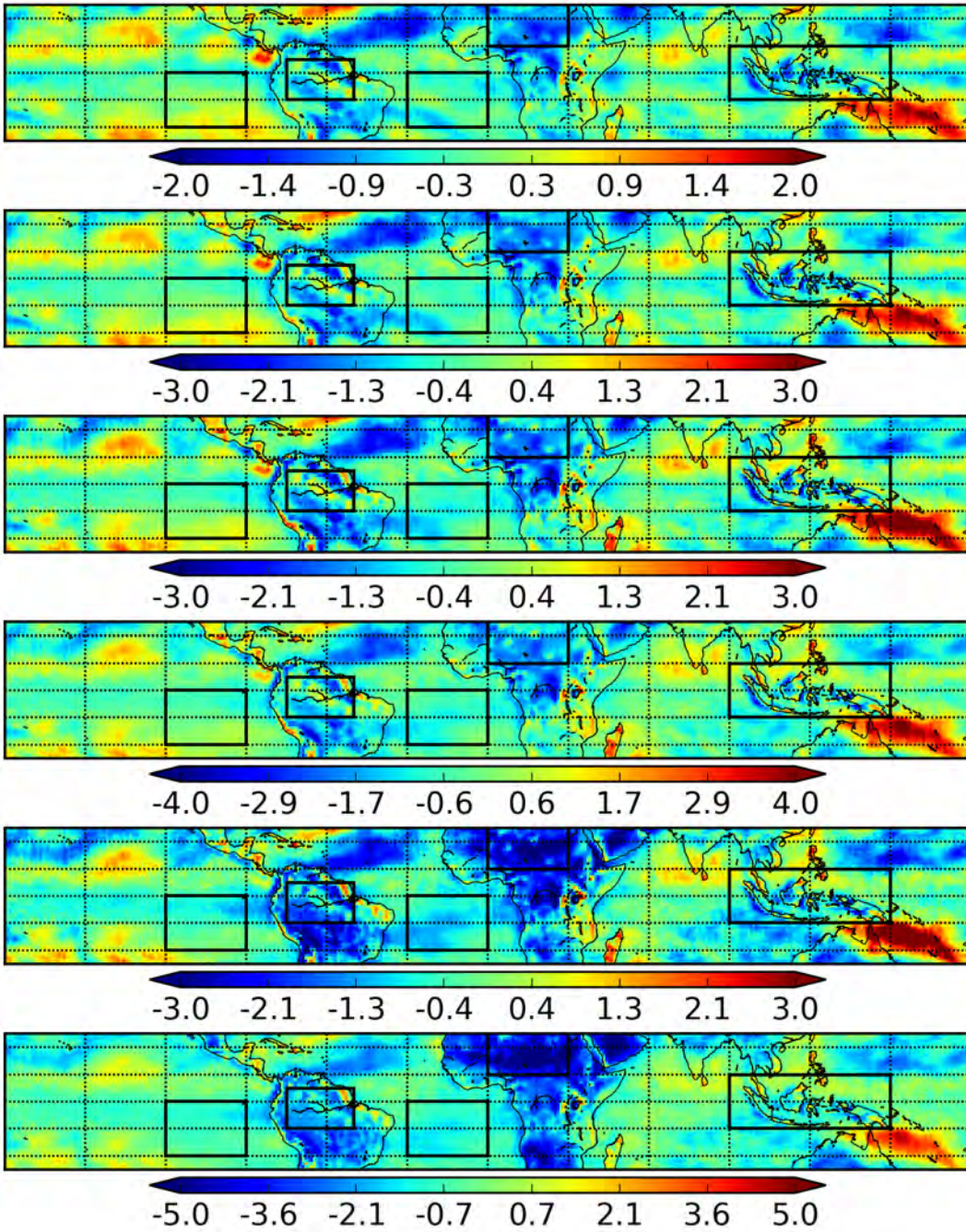


Figure 10. The coefficient b_1 (with respect to liquid) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

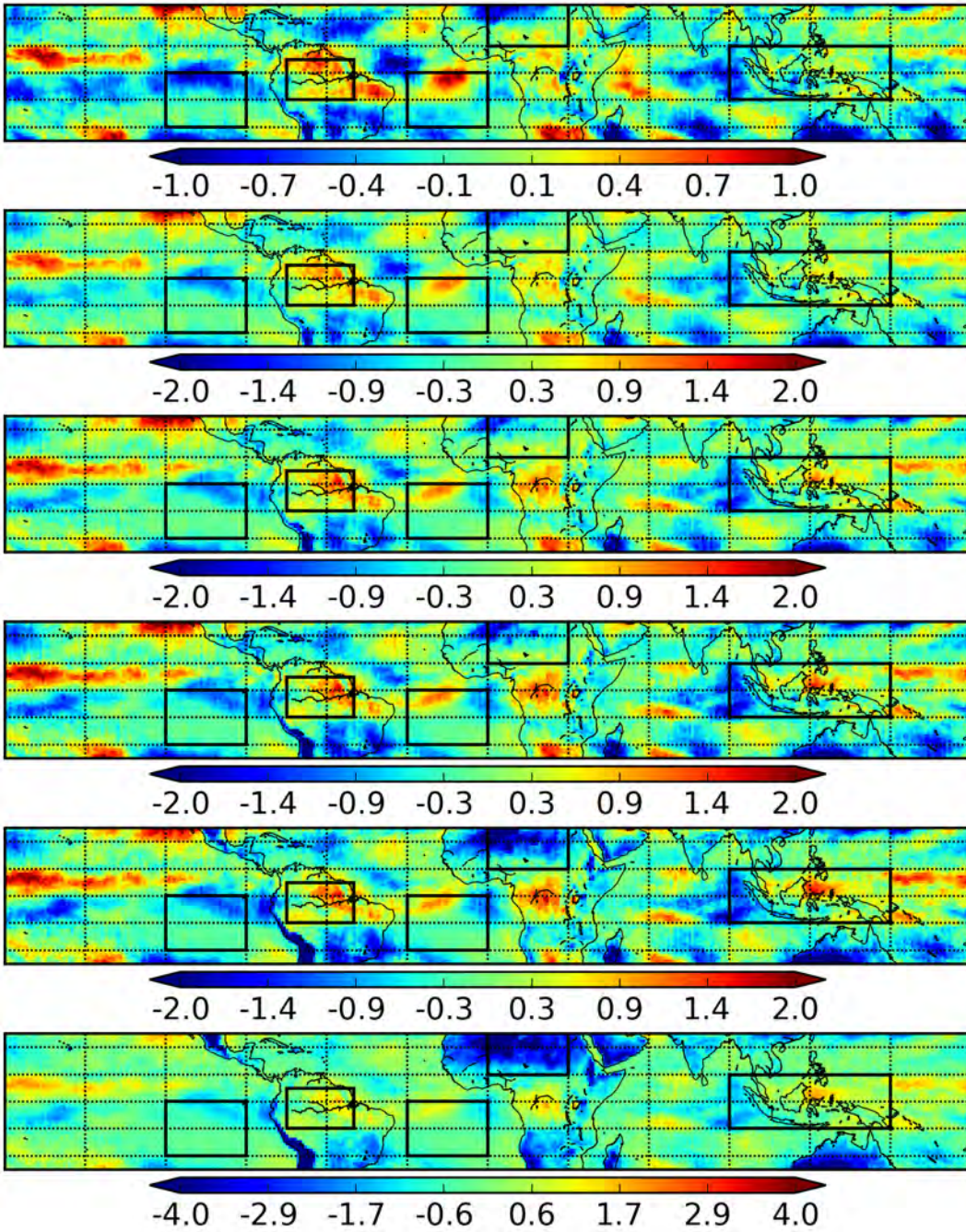


Figure 11. The coefficient a_2 (with respect to liquid) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

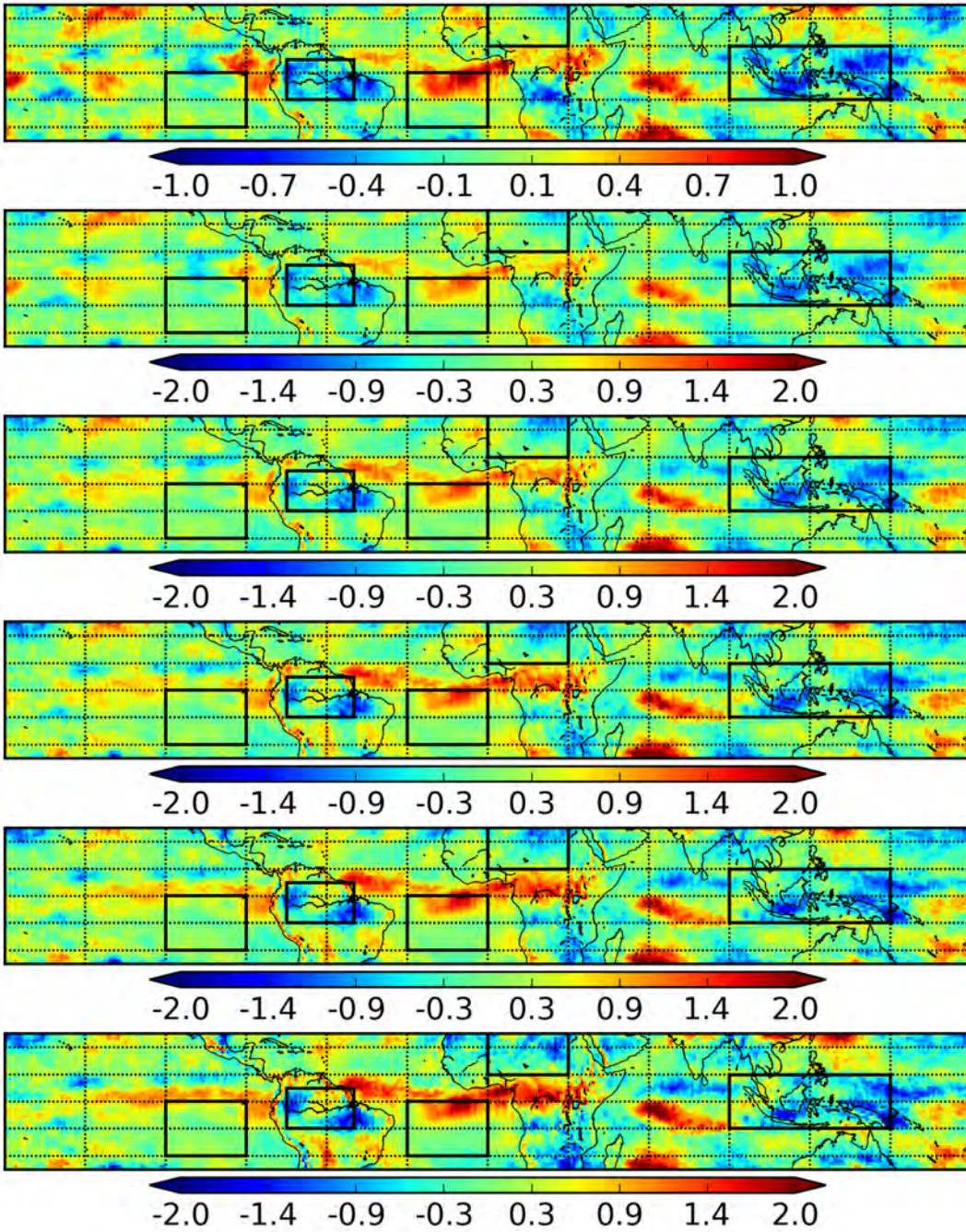


Figure 12. The coefficient b_2 (with respect to liquid) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

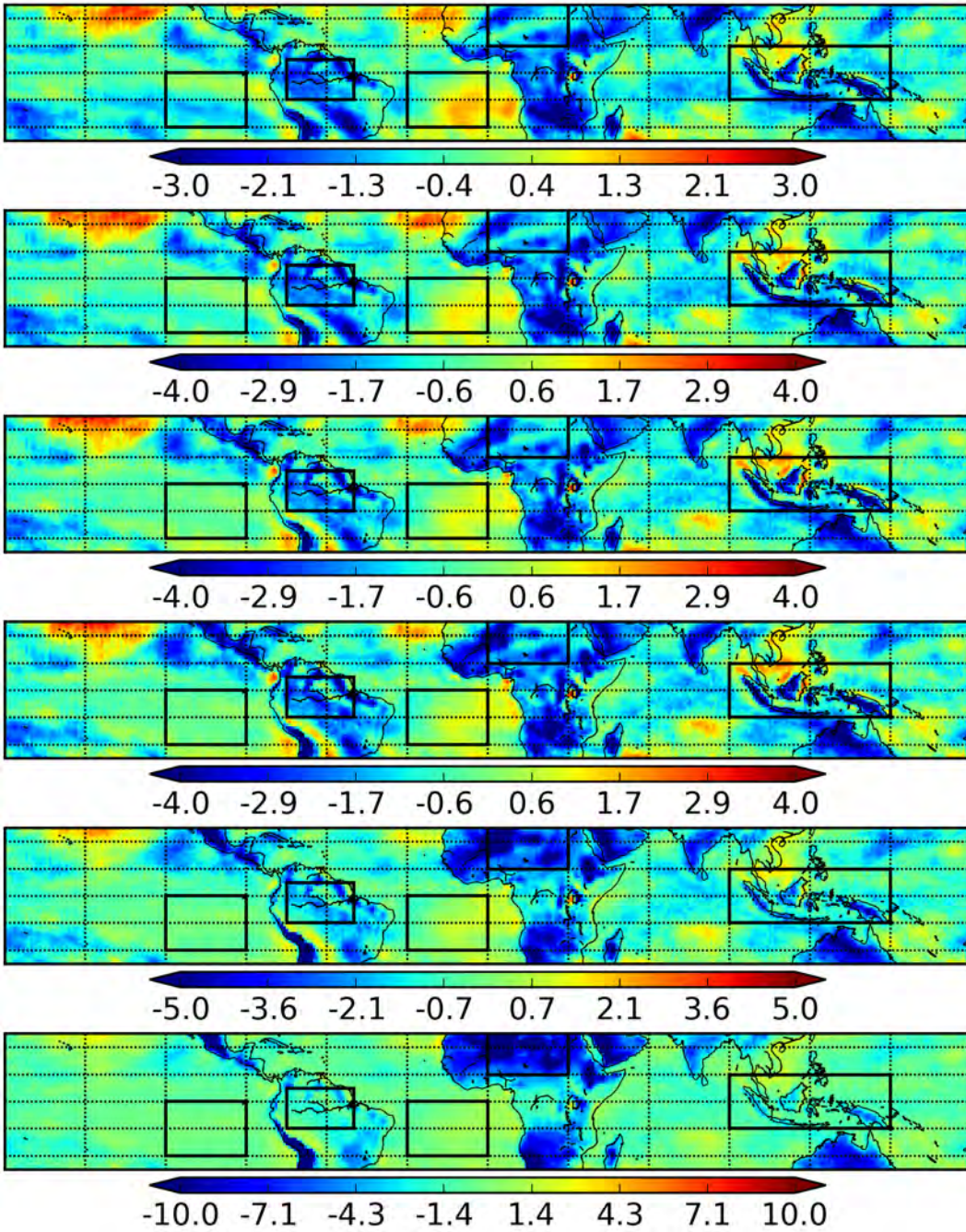


Figure 13. The coefficient a_1 (with respect to ice) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

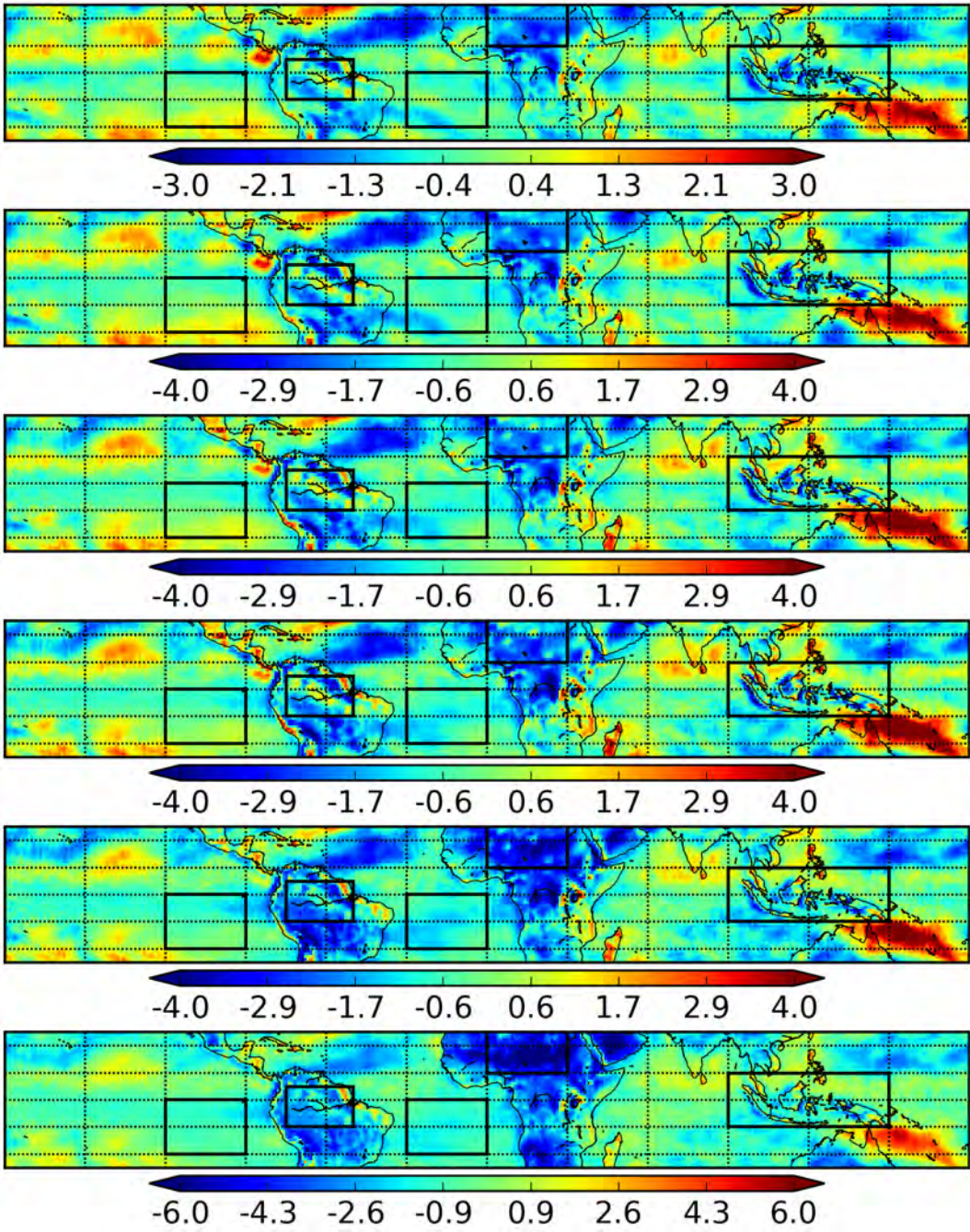


Figure 14. The coefficient b_1 (with respect to ice) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

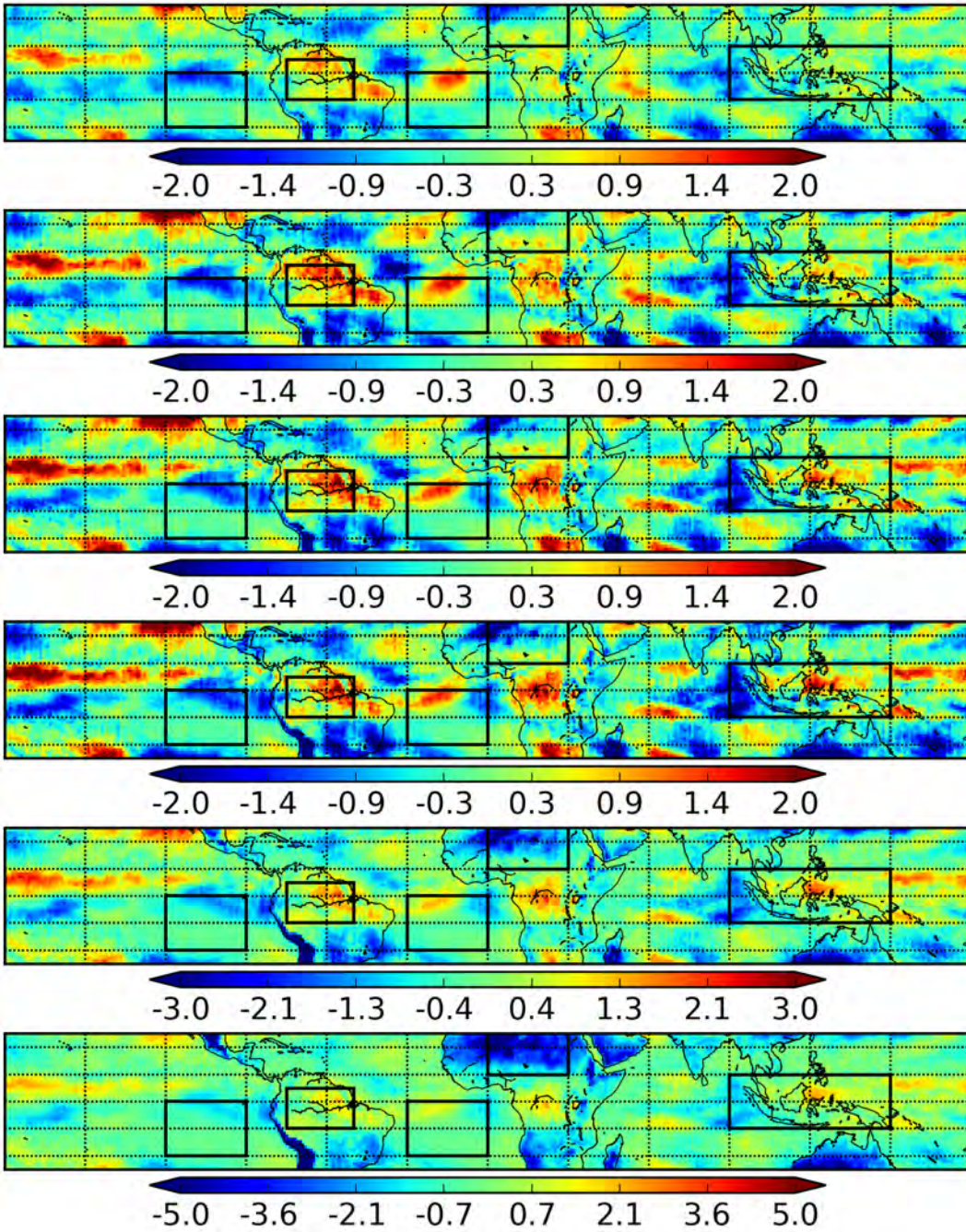


Figure 15. The coefficient b_2 (with respect to ice) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

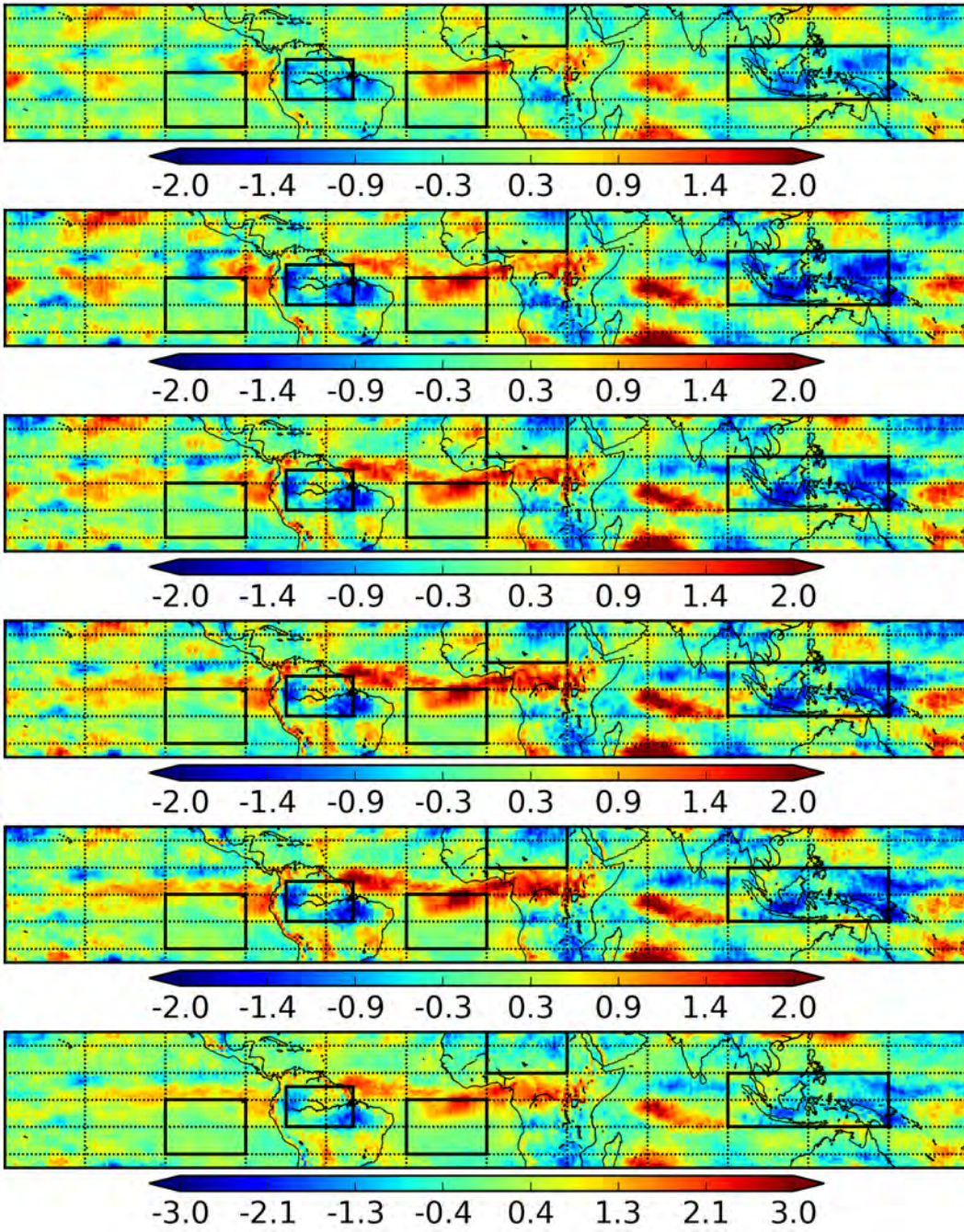


Figure 16. The coefficient b_2 (with respect to ice) for the Fourier series fit. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

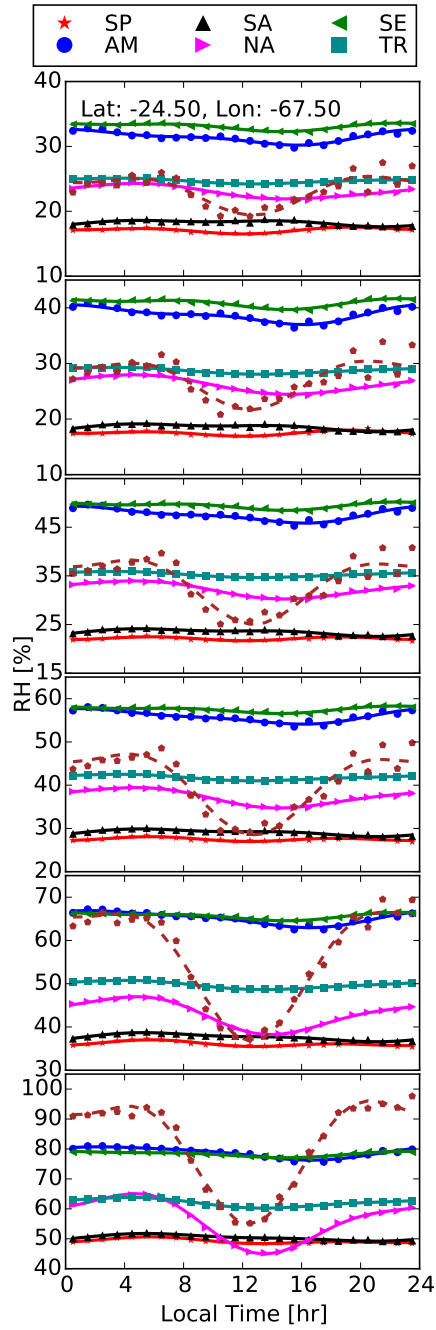


Figure 17. Diurnal cycle of layer-averaged RH_L as well as Fourier series fit for the selected regions. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

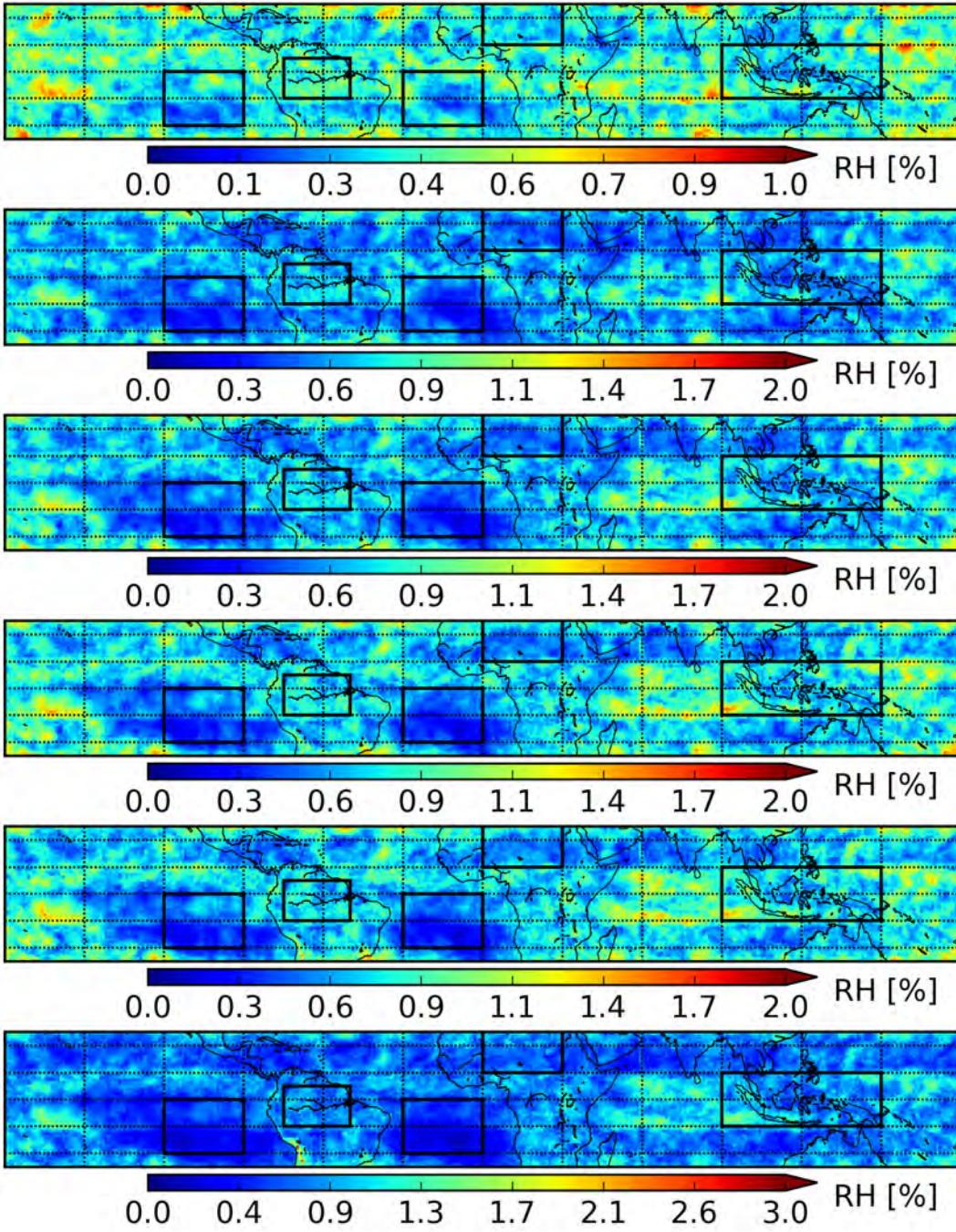


Figure 18. Mean absolute difference (with respect to liquid) between measurements and the fit for Fourier series. Plots from top to bottom are for SAPHIR channels 1-6, respectively.

5 Distribution Functions

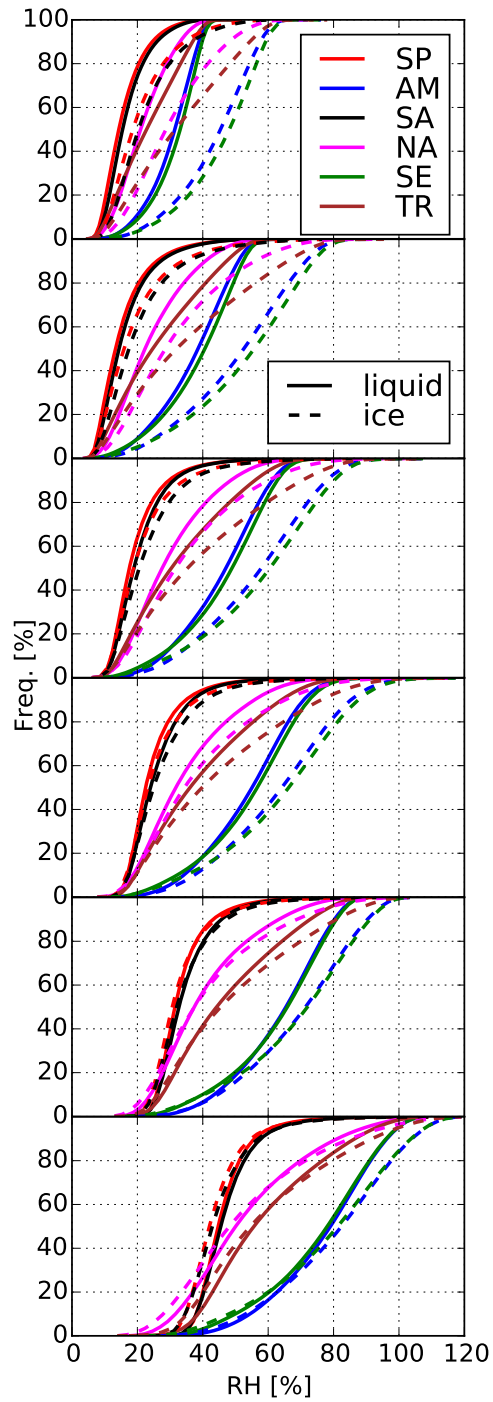


Figure 19. Cumulative probability distribution functions for relative humidity. Plots from top to bottom are for SAPHIR channels 1-6, respectively.