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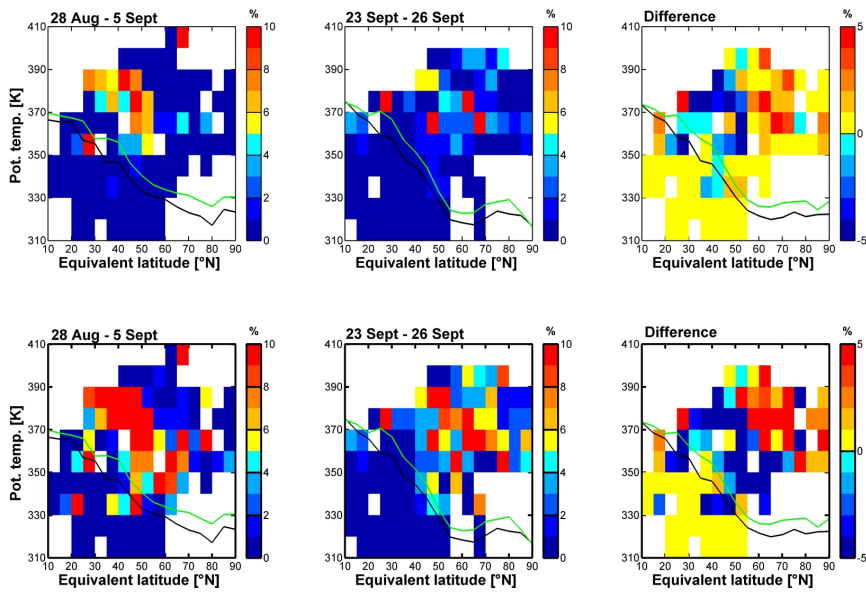
*Supplement of*

## **Impact of the Asian monsoon on the extratropical lower stratosphere: trace gas observations during TACTS over Europe 2012**

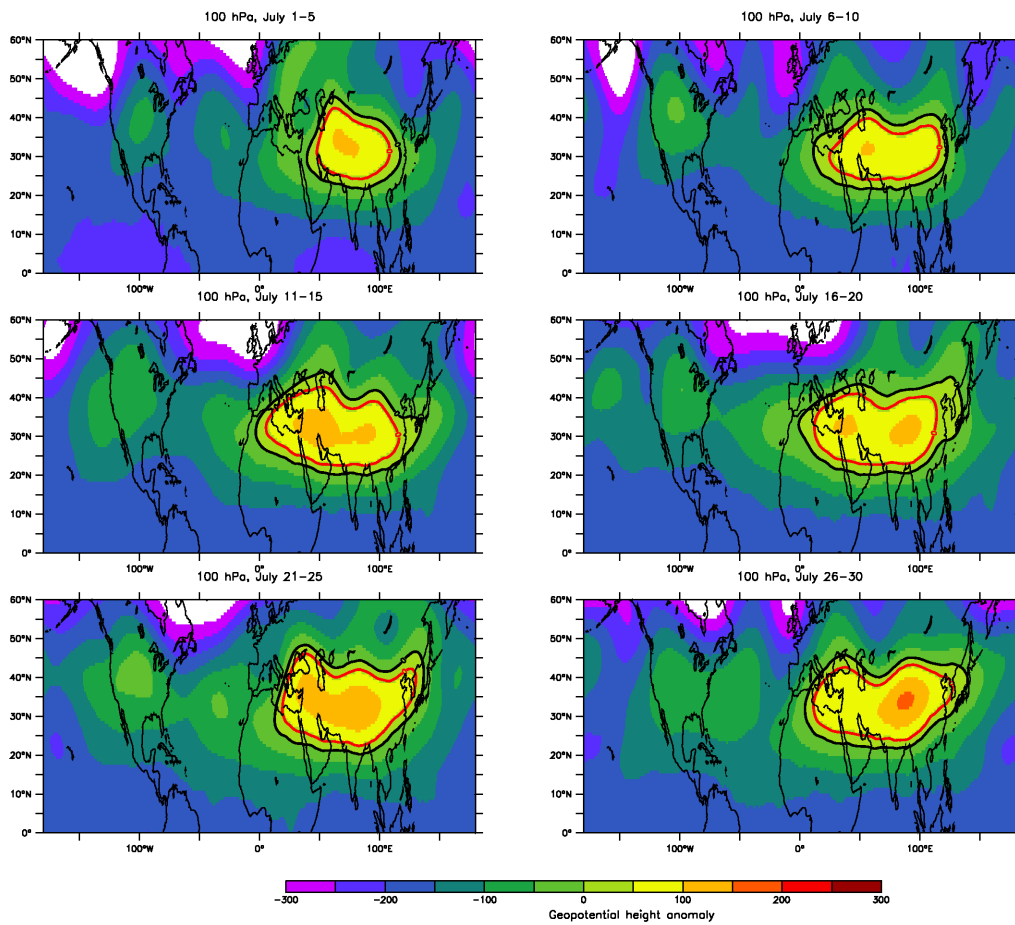
**Stefan Müller et al.**

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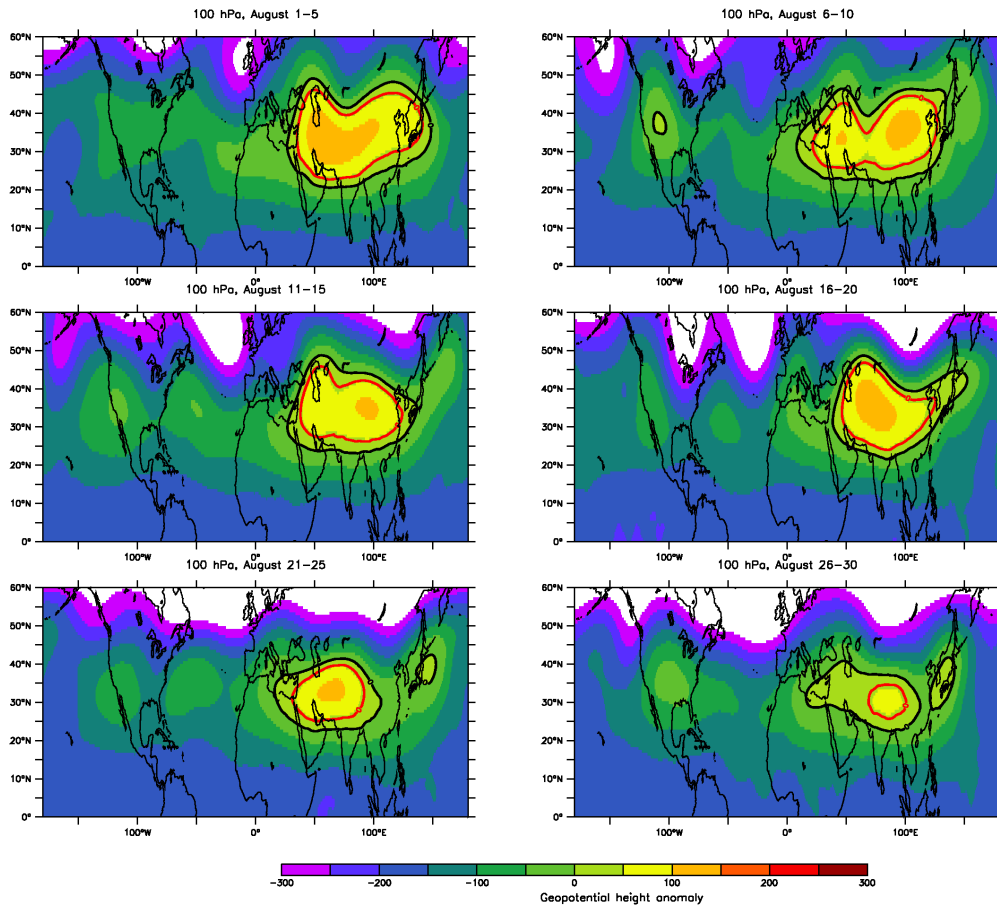
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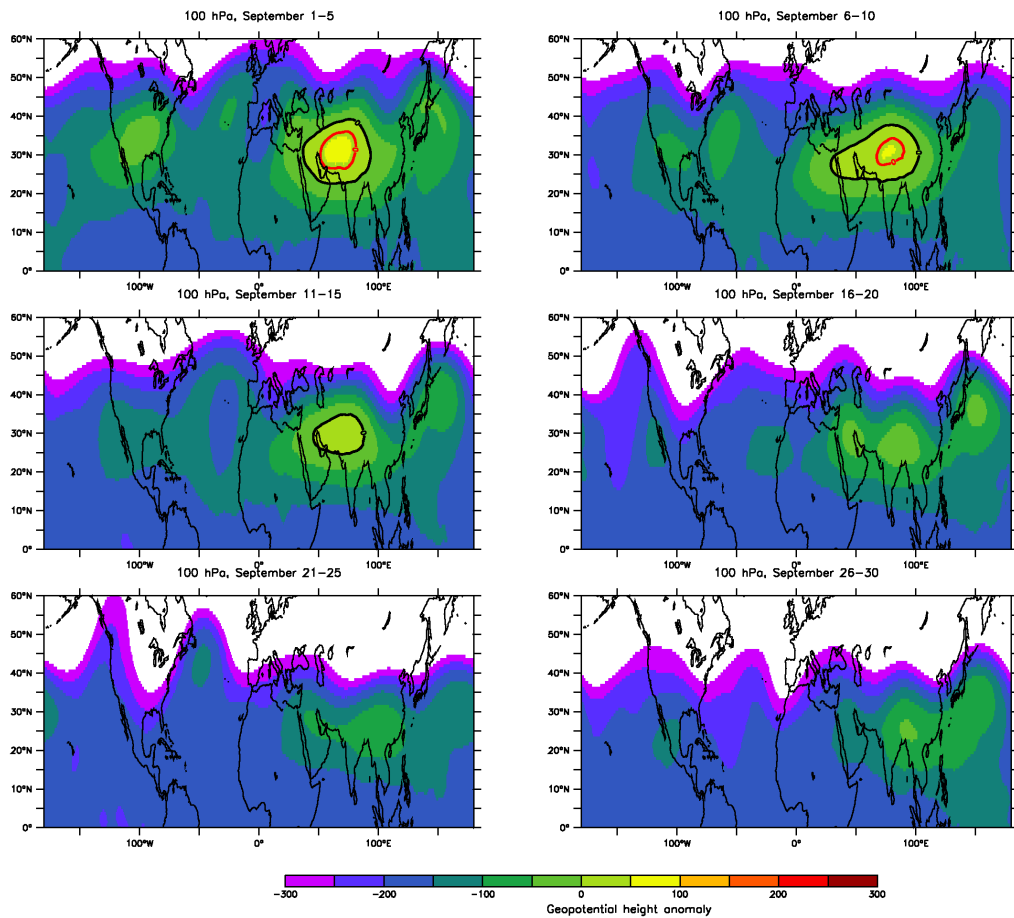
**Figure 1.** Same presentation as in Fig. 11. Proportion of data points for which 50-day back trajectories calculated with CLaMS-TRAJ indicate an origin in the Asian summer monsoon anticyclone. Criterion of top panel:  $20^{\circ}\text{N} < \text{TRA-latitude} < 40^{\circ}\text{N}$ ,  $30^{\circ}\text{E} < \text{TRA-longitude} < 110^{\circ}\text{E}$  and  $\text{Tra-}\Theta > 360\text{ K}$  for  $t = -30$  days. Criterion of bottom panel:  $15^{\circ}\text{N} < \text{TRA-latitude} < 50^{\circ}\text{N}$ ,  $30^{\circ}\text{E} < \text{TRA-longitude} < 120^{\circ}\text{E}$  and  $\text{Tra-}\Theta > 360\text{ K}$  for  $t = -30$  days.



**Figure 2.** Geopotential height relative to the climatological mean for JJA following the method of Bergman et al., (2013) for July 2012 in steps of 5 days. The color shading shows the geopotential height anomaly at 100 hPa relative to the JJA-average for 2012, the black contour marks the zero line. The red contour marks the anomaly relative to the multiannual JJA GP-height from Bergman et al., (2013).



**Figure 3.** Geopotential height relative to the climatological mean for JJA following the method of Bergman et al., (2013) for August 2012 in steps of 5 days. The color shading shows the geopotential height anomaly at 100 hPa relative to the JJA-average for 2012, the black contour marks the zero line. The red contour marks the anomaly relative to the multiannual JJA GP-height from Bergman et al., (2013).



**Figure 4.** Geopotential height relative to the climatological mean for JJA following the method of Bergman et al., (2013) for September 2012 in steps of 5 days. The color shading shows the geopotential height anomaly at 100 hPa relative to the JJA-average for 2012, the black contour marks the zero line. The red contour marks the anomaly relative to the multiannual JJA GP-height from Bergman et al., (2013).

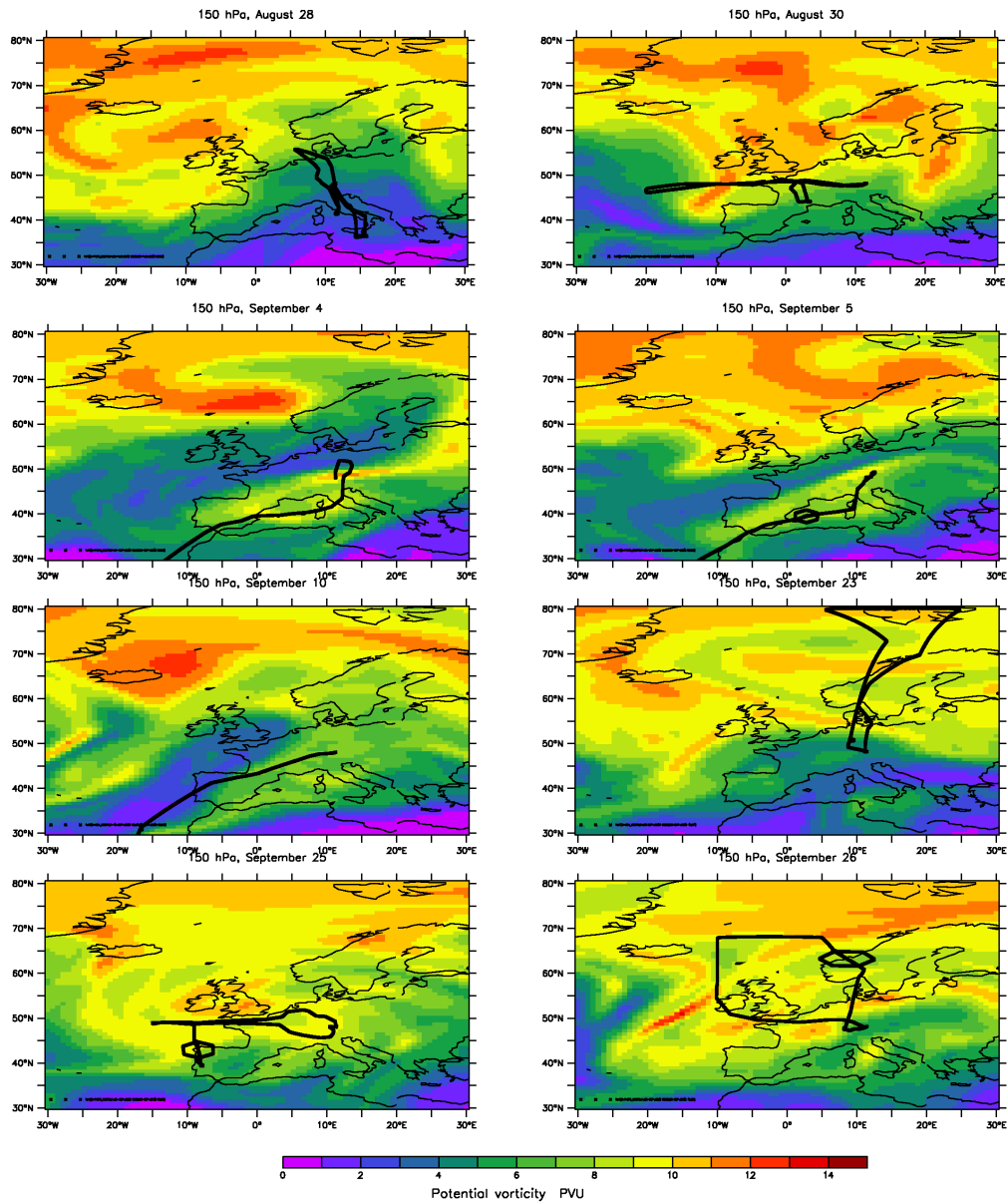


Figure 5. PV on P=150 hPa and flight paths of analyzed research flights during TACTS / ESMVal 2012.