Lagrangian Transport Time for C130 MIRAGE Flights

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WRF and WRF-Chem meteorological fields will be used to calculate air mass trajectories for each flight day of the C-130 back trajectories were initialized at the aircraft location and time and tracked back several days. These trajectories give an indication of when air was last influenced by various pollutions sources such as Mexico City, the Tula refinery or volcanic venting.

This information will be used to organize aircraft observations according to the time since last influenced by a pollutions source. As this time becomes longer it is expected that the concentrations of pollutant will decrease as a change of atmospheric processes including mixing, chemical loss, chemical production (in some instances), uptake onto particulate matter, deposition and washout. By performing this analysis on several chemical species where removal and change processes occur with varying intensity we expect that it will be possible to distinguish the different influences and make approximate estimates of the relative magnitude of the processes that can be used to check for consistency with published physical and chemical constants and with model simulations.

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