

## **6b.12 Inline coupling of WRF-HYSPLIT: model development and evaluation using tracer experiments**

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A Lagrangian dispersion model, HYSPLIT, has been coupled (inline) to the WRF-ARW meteorological model in such a way that the dispersion calculation is run as part of the WRF-ARW prediction calculation. This inline HYSPLIT takes advantage of the higher temporal frequency of WRF-ARW variables compared to what would be available for the offline approach and it uses the same vertical coordinate system as WRF-ARW, resulting in a more consistent depiction of the state of the atmosphere and the dispersion simulation. The newly developed inline system was evaluated by comparing inline and offline results with measured tracer concentrations from two controlled experiments – CAPTEX in regional scale and ASCOT in fine scale. The results between the two approaches were very similar for all six releases in CAPTEX. However, for the ASCOT experiments, the cumulative statistical score of the inline simulations was better than or equal to offline runs in four out of five releases. While the use of the inline approach did not provide any advantage over the offline method for the regional scale dispersion represented by the CAPTEX experiment, it was able to improve the simulation for the fine spatial and temporal resolution over complex terrain area represented by ASCOT experiment.