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Analysis of FLEXPART performance in an operational atmospheric transport modeling environment at CTBTO

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CTBTO runs FLEXPART operationally on a daily basis in backward mode to estimate sources of aerosols and noble gases detected at 80 stations distributed throughout the world. The FLEXPART runs are currently set up so that multiple simulations - each with eight receptor stations - are performed, and, additionally, each of the configurations is run twice - once with NCEP GDAS input and once with ECMWF 1.0 degree input. In anticipation of the deployment of higher-resolution simulations, CTBTO has acquired high-end, multi-core computing systems. It is now important to assess the time and memory resources required for different model configurations in order to optimise the utilisation of the new computing systems.

In this presentation we describe the performance of FLEXPART in an operations-like environment under different model configurations, to include varying number of receptors per simulation. For example, we need to understand the tradeoffs in running FLEXPART only a couple of times, each with a full set of receptors, versus the other extreme of running FLEXPART a large number of times, each with only a small number of receptors. This will all be evaluated at model resolutions ranging from the current 1.0 degrees down to 0.5 degrees, and then 0.2 degrees. In addition to the above, we will explore possibilities of various resources allocation schemes, including running multiple instances of FLEXPART on a single multicore-node, versus running one instance of FLEXPART per node.