

Performance Enhancement of Flexpart Atmospheric Transport Model for GPU Environment

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The Flexpart Atmospheric Transport Model is used in daily operations at CTBTO for the backtracking of radionuclides based on measurements at 80 sites worldwide. Over 280 simulations are performed each day and it is desirable to make each simulation run in a shorter period of time. With increased availability of GPU environments, it is natural to consider their potential in speeding up the Flexpart simulations. Work is currently underway to transform a CTBTO customized Flexpart v10 into a code that can efficiently use GPUs. To date much effort has been expended in getting this code (and its dependencies) to compile and execute in an NVIDIA Fortran (nvfortran) environment, leading to discovery of bugs in the nvfortran compiler, resolved by NVIDIA as a result of our reports. While awaiting resolution from NVIDIA, we have performed detailed profiling on smaller problem sizes in order to identify the “hot spots” of the code where GPU optimization might provide the greatest benefits. Work is now underway to isolate the “hot spot” regions of code into test modules suitable for extensive iterative experimentation, development and testing. This work is ongoing, and this presentation will describe a detailed overview of the project and its current status.

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Promotional text

This is an overview of an ongoing EU-funded project to enhance the performance of the Flexpart Atmospheric Transport Model by using Graphical Processing Units (GPUs)

Oral preference format

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