



## **VERES: a VERsatile Earth Simulator in pure Python**

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A primitive equation ocean model (Eden et al. 2016) and a marine biogeochemistry module (Schmittner et al. 2005) are translated from Fortran to Python and coupled. Apart from the excitement of the technological challenge, one motivation has been to give students & not-numerically-inclined scientists an easy way to test their hypotheses and to reduce the time from idea to experiment. The experience shows that the climate community can easily move away from the Fortran based legacy codes, embrace best practices and adopt new technologies that are rapidly changing high performance computing in the non-academic world. A key element for VERES is Bohrium (Kristensen et al. 2016), a framework that allows the online fusion of array operations and leads to a performance of the Python code that is slightly better than that of the original Fortran based codes (Haefner et al. 2018). Furthermore, Bohrium allows parallel execution of the same Python code on both CPU and GPU architectures. In this presentation we will discuss the basic structure of the VERES/Bohrium architecture and highlight how VERES lowers the barrier of entry for Earth System Model research. Furthermore we will present a couple of public domain Python tools that allow easier debugging than in Fortran and simple visualization for workflow analysis.