



Digital Twinning of Geophysical Extremes

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The geophysical research community has developed a relatively large amount of numerical codes and scientific methodologies which are able to numerically simulate through physics the extreme behavior of the Earth systems (for example: volcanoes, tsunamis earthquakes, etc). Furthermore, nowadays, large volumes of data have been acquired and, even near real-time data streams are accessible. Therefore, Earth scientist currently have on their hands the possibility of monitoring these events through sophisticated approaches using the current leading edge computational capabilities provided by pre-exascale computing infrastructures. The implementation and deployments of 12 Digital Twin Components (DTCs), addressing different aspects of geophysical extreme events is being carried out by DT-GEO, a project funded under the Horizon Europe programme (2022-2025). Each DTC is intended as self-contained entity embedding flagship simulation codes, Artificial Intelligence layers, large volumes of (real-time) data streams from and into data-lakes, data assimilation methodologies, and overarching workflows which will be executed independently or coupled DTCs in a centralized HPC and/or virtual cloud computing research infrastructure.

