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A web portal for hydrodynamical, cosmological simulations

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The amount of data generated by hydrodynamic cosmological simulations (~ 1PB) poses a physical barrier when it comes to opening the access and sharing results with the scientific community: queries, look ups and filtering over such high amount of data need High Performance Computing (HPC) skills that are often not part of the background knowledge of a scientist working in such field; additionally, only HPC facilities are capable of containing this amounts of data, and these storage systems are typically closed to the public. For these reasons we built a web portal for accessing and sharing the output of large, cosmological, hydrodynamical simulations with a broad scientific community (link: https://c2papcosmosim.uc.lrz.de). Users can browse the results of simulations (i) by navigating 2D maps, (ii) by graphically performing highly compounded and elaborated queries or (iii) graphically by plotting arbitrary combinations of properties. Users can then run analysis tools on a chosen object: (i) CLUSTERINSPECT visualizes properties of member galaxies of a selected galaxy cluster; (ii) SIMCUT returns the raw data of a sub-volume around a selected object from a simulation, containing all the original, hydro-dynamical quantities; (iii) SMAC creates idealized 2D maps of various, physical quantities and observables of a selected object; (iv) PHOX generates virtual X-ray observations with specifications of various current and upcoming instruments.

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