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**Large-scale relativistic simulations in the characteristic approach**[1]
ROBERTO GOMEZ, Pittsburgh Supercomputing Center, WILLIANS BARRETO, Universidad de Los Andes, Merida, Venezuela, SIMONETTA FRITTELLI, Duquesne University — We report on high-resolution computations in the characteristic approach to numerical relativity, using an extensible, highly scalable computational framework (LEO). A combination of a multi-bloc decomposition of the sphere (the "cubed sphere"), with spin raising and lowering ("eth") operators on non-conformal coordinates, and a first order reduction of the Einstein equations is used to obtain a stable, globally second-order accurate numerical method. Applying the framework to a scalar field minimally coupled to gravity in three dimensions, we extract quasi-normal modes, and notice the appearance of energy saturation effects. We analyze the scaling properties of the underlying framework and discuss possible extensions.

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