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A GRID approach for Gravitational Waves Signal Analysis with a Multi-Standard Farm Prototype

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The standard procedures for the extraction of gravitational wave signals coming from coalescing binaries provided by the output signal of an interferometric antenna may require computing powers generally not available in a single computing centre or laboratory. A way to overcome this problem consists in using the computing power available in different places as a single geographically distributed computing system. This solution is now effective within the GRID environment, that allows distributing the required computing effort for specific data analysis procedure among different sites according to the available computing power.

Within this environment we developed a system prototype with application software for the experimental tests of a geographically distributed computing system for the analysis of gravitational wave signal from coalescing binary systems. The facility has been developed as a general purpose system that uses only standard hardware and software components, so that it can be easily upgraded and configured. In fact, it can be partially or totally configured as a GRID farm, as MOSIX farm or as MPI farm. All these three configurations may coexist since the facility can be split into configuration subsets. A full description of this farm is reported, together with the results of the performance tests and planned developments.

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