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The capability of water Cherenkov detectors arrays of the LAGO project to detect Gamma-Ray Burst and High Energy Astrophysics sources

Gamma-Ray Bursts (GRBs) are of the brightest transients detected, with typical energies in their prompt phase ranging from keV to GeV. Theoretical models predict emissions at higher energies in the early times of the afterglow emission, and recently GRB190114C was the first GRB detected at TeV energies by the MAGIC experiment.
The Latin American Giant Observatory (LAGO) operates a network of water Cherenkov detectors (WCD) at different sites in Latin America. Spanning over different altitudes and geomagnetic rigidity cutoffs, the geographic distribution of the LAGO sites, combined with the new electronics for control, atmospheric sensing, and data acquisition, allows the realization of diverse astrophysics studies at a regional scale. LAGO WCDs located at high altitudes possess good sensitivity to electromagnetic secondary radiation that is the expected signature of this kind of high energy event on the ground. It is worth mentioning that due to the characteristics of the WCD and the Wide Field of View (FOV) LAGO possesses a large aperture high duty cycle.
In this work, we present the results of the sensitivity of LAGO small arrays of WCDs for the detection of events like GRB190114C. Also, we extend the study to other galactic sources that are known to emit energies above TeV, such as Pulsar Wind Nebulas, TeV halos and some sources with unidentified categorization. These are interesting sources to study taking advantage of the long term monitoring capabilities of LAGO. We use a dedicated simulation process: ARTI, a toolkit developed by LAGO for high energy air showers, MEIGA, a framework to simulate the response of the detectors and OneDataSim, the new high-performance computing and cloud-based implementation of our simulation framework.

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