

Abstract Submitted
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Noise from thunderstorms coupling into the LIGO gravitational-wave observatory GUILLERMO VALDES, Louisiana State University, ERICKA FLORIO, Kenyon College, BRINA MARTINEZ, Center for Gravitational Wave Astronomy, University of Texas Rio Grande Valley, ERIN THOMPSON, Clemson University, ANAMARIA EFFLER, LIGO Observatory, GABRIELA GONZALEZ, Louisiana State University, BRIAN O'REILLY, LIGO Observatory, ALEXANDER URBAN, Louisiana State University — The observation of gravitational waves requires extremely sensitive detectors, such as LIGO and VIRGO. Its sensitivity can be overwhelmed by local environmental noises such as the ones produced by thunderstorms. We have developed a new tool to identify thunders using acoustic features extraction, machine learning algorithms, and multilateration and posteriorly quantify their effect on the LIGO Livingston observatory (LLO). We found that the LLO's detection range decreased by 10% during thunderstorms and that there is a high correlation between the vibrations in one of the vacuum chambers and the noise between 20Hz and 50Hz in the gravitational-wave channel.

Guillermo Valdes
Louisiana State University

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