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CTAO LST–1 observations of magnetar SGR 1935+2154: deep limits on sub-second bursts and persistent TeV emission

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The first observational evidence linking magnetars and Fast Radio Bursts (FRBs) was the detection of simultaneous radio and X-ray bursts from the Galactic magnetar SGR 1935+2154 in 2020.
We analysed over 25 hours of observations from the Large-Sized Telescope prototype (LST-1) of the Cherenkov Telescope Array Observatory (CTAO) during periods of high-energy activity in 2021 and 2022, searching for a potential TeV counterpart to both persistent and millisecond-scale burst emission.
For bursting emission, we examined nine 0.1-second windows centered on known short X-ray bursts, targeting possible millisecond-scale TeV signals in a low-photon-statistics regime.
While no persistent or bursting TeV emission was detected, our results place upper limits on the TeV flux of short magnetar bursts and highlight the potential of magnetars and FRBs as promising candidates for future CTAO observations.

Authors: LÓPEZ ORAMAS, Alicia; BULGARELLI, Andrea (Istituto Nazionale di Astrofisica (INAF)); SIMONGINI, Andrea (Istituto Nazionale di Astrofisica (INAF)); PANEBIANCO, Gabriele (Istituto Nazionale di Astrofisica (INAF)); Dr MEREGHETTI, Sandro (Istituto Nazionale di Astrofisica (INAF))

Co-authors: CAROSI, Alessandro (Istituto Nazionale di Astrofisica (INAF)); DI PIANO, Ambra (Istituto Nazionale di Astrofisica (INAF)); Prof. VIGNALI, Cristian (Dipartimento di Fisica e Astronomia, Università di Bologna); Dr JIMÉNEZ-MARTÍNEZ, Irene (Max Planck Institute for Physics); Dr PARMIGGIANI, Nicolo' (Istituto Nazionale di Astrofisica (INAF)); Dr BORDAS, Pol (IEEC-UB); ZANIN, Roberta (Istituto Nazionale di Astrofisica (INAF)); Dr LÓPEZ-COTO, Rubén (IAA-CSIC); Dr HASSAN, Tarek (CIEMAT)

Presenter: PANEBIANCO, Gabriele (Istituto Nazionale di Astrofisica (INAF))

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