Contribution ID: **132** Contribution code: **TRANS/MWL/MM/DM** Type: **Poster**

AGILE activity on FRB high-energy counterparts search

Wednesday, September 4, 2024 8:08 AM (1 minute)

The AGILE space mission, with its unique features (two coaligned imaging X-and gamma-ray detectors, a non-imaging calorimeter, and the observing capability to cover about 80 %if the sky in 7minutes) makes it very suitable in seatch for high-energy counterpar of transient of various nature. AGILE participated in all the recent campaign to search for electromagnetic (e.m.) counterparts to gravitational wave (GW) events detected by the LIGO -Virgo-KAGRA interferometers. We developed a dedicated pipeline to analyze data from all detectors on short timescales around external trigger times, and their spatial extension, which was applied also to GRB triggers or other transients,either on real-time data or on archival search.
We started the search for Fast Radio Bursts (FRBs) high-energy counterpart on 2019, after the increasing discoveries by CHIME/FRB instrument of Repeating-FRBs(R-FRBs) at low Dispersion Measure (DM), on average proportional to distance so that these sources at ~100 pc cm^-3 are at reduced distances with respect to the mean sample of FRBs detected at much higher DM values. We developed a dedicated pipeline to execute archival searches for gamma- and X-ray counterpart in the MCAL and GRID detector data in the context of the AGILE procedures for triggered transient sources.
We first searched a possible gamma-ray emission for two nearby FRBs, FRB20180916B and FRB20181030A, and then we set up the first MW campaign on FRB20180916B ssource, including italian radio telescope (mainly the Northern Cross) and the Swift mission, once has been discovered to have periodic "activity" phases of ~5 days. No detection has been obtained either in AGILE or Swift data, but we could put contraints to the possible gamma-ray emission for a magnetar model, excluding the occurrence of giant flares like the 2005 one from SGR 1806-20 (10^46 erg in MeV range), which could be detectable by AGILE. As first results from the Swift campaign the non-detection in 0.3-10 keV, were described in some works (Tavani et al. 2020, 2021; Pilia et al. 2020; Trudu et al 2021) where we considered various scenarios including a magnetar source or some other model for instance including a BH, comparing the burst L_radio with the L_^UL_x/gamma. The 2020 discovery of a ms radio burst from SGR 1935+2154 simultaneous to a weak X-ray burst, also detected by AGILE, has been interpreted as a possible confirmation of the magnetar model for at least a sub-class of FRBs, and we compare this burst with the X-ray campaign on FRB20180916B. We will discuss the AGILE results within the MW collaboration, either on the specific FRB20180916B source or on a general study of all the sources known in 2021 (Verrecchia et al.2021) that we are currently updating, in order to improve the investigation of E_radio/E_X ratio which for the FRB200428/SGR 1935+2154 was ~10^-5, while, considering FRBs X-ray ULs, it reaches ~10^-8. We will describe current AGILE post-operations activities and the recent MW campaigns.

Author: VERRECCHIA, Francesco (Istituto Nazionale di Astrofisica (INAF))

Co-authors: Dr CASENTINI, Claudio (Istituto Nazionale di Astrofisica (INAF)); Dr TAVANI, Marco (INAF/IAPS)

Presenter: VERRECCHIA, Francesco (Istituto Nazionale di Astrofisica (INAF))

Session Classification: Poster hang