Contribution ID: **18** Type: **Oral**

Searching for TeV-emitting candidates among the X-ray bright blazar population

Monday, 17 June 2024 13:00 (20 minutes)

Extragalactic surveys search for unexpected and serendipitous phenomena, resulting in sources catalogues of unvaluable scientific interest. A Very High Energy survey would be able to add data in a still mostly unknown energy band, finding crossmatches for existing X-ray sources and improving their modelling.
The purpose of this work is to understand if, among the blazars not detected by Fermi-LAT, a population of TeV emitting sources could be detected by current or future Cherenkov telescopes. We cross-matched the 5BZCAT catalog of blazars with the most recent catalogs of point-like sources detected by XMM-Newton, Chandra, Swift-XRT. After the recent eROSITA-DE Data Release 1, we performed a crossmatch of the blazars located in the part of the sky covered by this survey.
Finally, we studied the sources without a 4FGL-DR4 counterpart to assess their expected TeV emission. We focused on the objects with a maximum chance of being detected by current or future TeV detectors, based on selections on their X-ray to radio flux ratio and their synchrotron peak frequency. In conclusion, we determined if the X-ray emission can be used as an effective proxy to find and characterize candidate TeV-emitting blazars.

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Session Classification: Gamma-Ray and Multi-Messenger Astronomy

Track Classification: Gamma-Ray and Multi-Messenger Astronomy