

## Multi-wavelength analysis of VLASS compact objects: a novel catalog of blazar candidates

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Blazars, a population of active galactic nuclei (AGN), stand out for their intense and variable emissions spanning the electromagnetic spectrum. This study introduces a novel catalog of blazar candidates derived from a synergistic combination of the Very Large Array Sky Survey (VLASS) radio data with optical data from the Panoramic Survey Telescope and Rapid Response System (PanSTARRS). Leveraging the broad sky coverage and high resolution of VLASS, alongside the depth of PanSTARRS optical observations, we first identify radio sources with optical counterparts across the sky. The compact nature and the typical colors of blazars in the optical and infrared bands (thanks to the data of the Wide-field Infrared Survey Explorer - WISE), have been a guide to pinpoint candidates to be included in our catalog. Additionally, taking advantage of the extensive temporal coverage provided by PanSTARRS, we conducted an investigation into the variability of blazar sources, unveiling insights into their properties. To ensure a comprehensive view, we validate our findings with known catalogs such as Roma-BZCAT5, which is the most extensive collection of confirmed blazars to date, encompassing 3561 sources.

We anticipate significant advancements in blazar research with upcoming surveys such as the Vera C. Rubin Legacy Survey of Space and Time (Rubin-LSST). LSST's unprecedented combination of depth, area, and cadence will provide unparalleled opportunities for studying blazars across various wavelengths and timescales. The approach used in this study promises to yield deeper knowledge on the blazar population, in anticipation of the LSST era.

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