The ELM Survey South

Alekzander Kosakowski[1], Mukremin Kilic[2], & Warren R. Brown[3]

[1]*Department of Physics and Astronomy, Texas Tech University, Lubbock, TX 79409, USA*
[2]*Homer L. Dodge Department of Physics and Astronomy, University of Oklahoma. 440 W. Brooks St., Norman, OK, 73019 USA*
[3]*Smithsonian Astrophysical Observatory, 60 Garden St., Cambridge, MA, 012138 USA*

Extremely Low Mass (ELM) white dwarf binaries are an important class of object for studying the effects of compact binary evolution, including common envelope evolution, gravitational wave emission, and sub-Chandrasekhar merger products. A large sample of ELM white dwarf binaries is thus required to obtain meaningful statistics on these evolutionary stages and to study the population as a whole.

The ELM Survey has identified over 100 low-mass white dwarf (LMWD) binaries to date, but only a few are located in the Southern sky. The original ELM Survey South's target selection used photometry from early data releases of SkyMapper and VST ATLAS to expand the ELM Survey to the South, but found a large fraction of their candidates to be contaminants such as subdwarfs or single white dwarfs.

Here we continue the search for ELM white dwarf binaries, primarily in the Southern sky, using a Gaia-based selection with Gaia DR2 and eDR3. We identify over 70 candidate LMWD binaries based on our spectroscopic follow-up and present a summary of our analysis to two dozen of these for which we obtained complete orbital solutions. We discuss the properties of these new binaries as part of the larger population and present a target selection region which aims to maximize the number of known LMWDs and facilitate efficient follow-up of our remaining spectroscopic candidates.