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Search for gamma-ray emission from the newly discovered close binary system AR Scorpii

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Detailed multi-frequency studies of the white dwarf pulsar AR Scorpii (AR Sco) revealed a Spectral Energy Distribution (SED) that showed optically thin synchrotron emission between IR and X-ray energies. This implies that AR Sco is a site of particle acceleration and associated pulsar-like synchrotron emission, which makes AR Sco an interesting source to search for possible gamma-ray emission in available Fermi-LAT data (100 MeV – 100 GeV). The focus of this MSc project is to do a complete analyses of the total Fermi-LAT data (2008-2018) by utilizing the upgraded Fermi-LAT Pass 8 data analysis pipeline to search for pulsed and unpulsed gamma-ray emission. The possible detection of gamma-rays from AR Sco will be a strong motivation for possible CTA and H.E.S.S. follow-up studies. A positive detection will also be invaluable to the field of gamma-ray astronomy, establishing close binaries containing fast rotating, highly magnetic white dwarfs, as a new class of gamma-ray source.

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