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On the expected orbitally-modulated TeV signatures of spider binaries

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'Spider'binary systems –black widow and redback compact binaries differentiated by their companion's mass and nature –are an important type of pulsar system exhibiting a rich empirical phenomenology, including radio eclipses, optical light curves from the heated companion, as well as non-thermal X-ray and GeV light curves and spectra. Multi-wavelength observations have now resulted in the detection of about 50 of these systems in which a millisecond pulsar heats and ablates its low-mass companion via its intense pulsar wind. Broadband observations establish the presence of relativistic leptons that have been accelerated in the stellar magnetospheres and near the intrabinary shock, as well as a hot companion. This presents an ideal environment for the creation of orbitally-modulated inverse Compton fluxes that should be within reach of current and future Cherenkov Telescopes. We have now included an updated synchrotron kernel, different parametric injection spectra, and several intrabinary shock geometries in our emission code to improve our predictions of the expected TeV signatures from spider binaries. Our updated phase-dependent spectral and energy-dependent light curve outputs may aid in constraining particle energetics, wind properties, shock geometry, and system inclination of several spider binaries.

Primary author: VENTER, Christo (North-West University)

Co-authors: Dr KOPP, Andreas (Centre for Space Research, North-West University, Private Bag X6001, Potchefstroom, South Africa, 2520); Dr WADIASINGH, Zorawar (Astrophysics Science Division, NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA); HARDING, Alice (Los Alamos National Laboratory); Dr BARING, Matthew (Department of Physics and Astronomy - MS 108, Rice University, 6100 Main Street, Houston, Texas 77251-1892, USA)

Presenter: VENTER, Christo (North-West University)

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