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Quantifying irradiation in spider pulsars: the extreme case of PSR J1622-0315

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Compact binary millisecond pulsars are systems in which the pulsar' s relativistic wind can strongly irradiate and ablate their companion star. Also known as spiders, they represent a promising site to find super-massive neutron stars. In this presentation I will show our multi-band optical light curves of PSR J1622-0315, one of the most compact known redbacks. The light curves indicate that the irradiation of the star's inner face by the pulsar wind is missing despite its short orbital period. These unexpected results, as well as the presence or absence of irradiation in the full spider population, can be interpreted by taking into account the ratio between the pulsar wind flux hitting the companion star and the companion intrinsic flux. The pulsar-to-companion flux ratio represents also a useful tool to find the most suitable systems to obtain accurate measurements of the neutron star mass from the optical light curve modelling.

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