

Analysing the orbital solutions of the gamma-ray binary HESS J0632+057 with new radial velocity measurements from SALT

Tuesday 11 October 2022 15:00 (15 minutes)

Gamma-ray binaries are a small subclass of high mass binaries, consisting of O or B/Be type stars and a compact object (in the mass range of a neutron star or black hole), that produce multiwavelength non-thermal emission up to TeV energies. The gamma-ray binary HESS J0632+057 still has no clear orbital solution, required to correctly interpret how the non-thermal emission is produced by the system. Two different, and incompatible solutions were proposed by Casares et al. 2012 and Moritani et al. 2018, through radial velocity measurements of the absorption lines and the H α emission line respectively. In order to better constrain the orbital solution we are undertaking independent radial velocity measurements, consisting of both the photospheric absorption lines and the H α , H β and H γ emission lines, using the optical spectra obtained with the HRS on SALT. In addition, we have investigated the archival data from the Moritani et al. and the Casares et al. studies, in order to analyse the effect of the updated orbital period of 316.8 and 317.3 days, determined from the modulated X-ray and TeV emission respectively, on the orbital solutions. We present the initial results from this campaign.

Track

Binaries

Author: Ms MATCHETT, Natalie (University of the Free State)

Co-authors: Prof. VAN SOELEN, Brian (University of the Free State); Prof. GRAY, Richard (Appalachian State University)

Presenter: Ms MATCHETT, Natalie (University of the Free State)

Session Classification: Parallel 4