

9 Sgr: uncovering an O-type spectroscopic binary with an 8.6 year period

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Context. The O-type object 9 Sgr is a well-known synchrotron radio emitter. This feature is usually attributed to colliding-wind binary systems, but 9 Sgr was long considered a single star.

Aims. We have conducted a long-term spectroscopic monitoring of this star to investigate its multiplicity and search for evidence for wind-wind interactions.

Methods. Radial velocities are determined and analysed using various period search methods. Spectral disentangling is applied to separate the spectra of the components of the binary system.

Results. We derive the first ever orbital solution of 9 Sgr. The system is found to consist of an O3.5 V((f+)) primary and an O5-5.5 V((f)) secondary moving around each other on a highly eccentric ($e = 0.7$), 8.6 year orbit. The spectra reveal no variable emission lines that could be formed in the wind interaction zone in agreement with the expected properties of the interaction in such a wide system.

Conclusions. Our results provide further support to the paradigm of synchrotron radio emission from early-type stars being a manifestation of interacting winds in a binary system.

Reference: arXiv:1205.3314

Status: Manuscript has been accepted

Weblink: <http://arxiv.org/abs/1205.3314>

Comments: Accepted for publication in Astronomy & Astrophysics

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