

A search of AGB binaries: the case of V Hydrae

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The presence of close-by companions is believed to be an essential ingredient to shape the outflow of the progenitor of bipolar planetary nebulae. However, only a handful of AGB binaries have been detected so far and their orbital characteristics are not well constrained. Here, we target the well-known carbon-rich star V Hydrae (V Hya), known to exhibit a complex environment believed to be shaped by an unseen companion.

Using a multi-epoch and multi-instrumental study, combining spectroscopic monitoring (HERMES/Mercator spectrograph) and infrared interferometric imaging with VLTI/MATISSE (as part of the ESO-Large Program BINAGB), we disentangled the AGB orbital motion from its Mira-like pulsation, provided the complete set of orbital parameters and showed that a dust clump is associated with the close companion. This dust clump is responsible for the visual obscuration events occurring every 17 years. Based on spatio-kinematic modeling of a conical high-velocity outflow attached to the companion, we provide constraints on the gas and dust distribution.

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