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Phased accretion and a dynamically-truncated eccentric circumbinary disc cavity in a pre-main-sequence binary system

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Pre-main-sequence binary systems provide a unique laboratory for studying dynamical truncation in discs. We studied the inner region of a nearby Herbig Ae/Be binary system using the VLTI/GRAVITY and VLTI/PIONIER instrument. Spectrally-dispersed interferometry with GRAVITY allowed us to determine the origin of the Br γ line emission and to study how the accretion rates on the primary and secondary vary over the orbit. We constrained the orbit and dynamical masses of the stars, and resolved dust arranged in a circumbinary disc. The measured inner disc radius is considerably larger than the theoretical dust sublimation radius, suggesting that the disc is dynamical truncated by the binary. One side of the circumbinary disc appears consistently brighter, indicating that the disc cavity is eccentric, which matches the prediction from smooth-particle hydrodynamic simulations of eccentric binaries. Finally, we found that the variable Br γ line emission is associated with accretion onto the primary and secondary. We derived the individual accretion rates and found that the primary accretes at roughly constant rate, while the accretion rate on the secondary is strongly phase-dependent and peaks around periastron passage.

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