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Steps towards disentangling asymmetric AGB winds using MATISSE: the case of X TrA

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Severe mass-loss is the reason behind the ending of the asymptotic giant branch (AGB) stellar evolutionary stage, this phase having a high importance for the recycling of heavy elements within the interstellar medium. A very intricate process, many clues regarding the formation and evolution of AGB winds are still hidden in the close and extended environments of AGB stars. Believed to form from ejected AGB atmospheres, planetary nebulae (PNe) provide extra constraints on the mass-loss picture. One such aspect is the ratio of observed asymmetric PNe to AGB stars that have a companion, which does not not match that well. Observationally, symmetry also appears to be affected by the chemical type of the star, carbon-rich stars showing more asymmetric features in their envelopes than their oxygen-rich counterparts. As part of an ESO Large Program, VLTI/MATISSE is used to observe a sample of different (chemical type and companionship status) AGB stars as a means of investigating the problems mentioned above. Covered here will be X TrA, a non-binary carbon star from this sample for which previous studies have found some extended infrared ring morphology along with SiC dust features. The focus will lie on the image reconstruction and modelling process, followed by any potential implications regarding previous results and the asymmetries observed in carbon-rich AGB winds.

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