A systematic study of the connection between binarity and overabundances in HgMn stars

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Context

The phenomenon of late B-type stars showing HgMn anomalies seems to be intimately linked with their multiplicity. In a study with NACO, we were able to demonstrate that more than 90% of the HgMn stars in the sample displayed evidence for a companion. Strikingly, most late-B-types stars in binaries with certain orbital parameters become HgMn stars. Following the NACO observations, we started to study a sample of 79 HgMn stars with PIONIER on the VLTI in 2014. Here, we present the first results.

First steps with NAOS/CONICA

Between 2004 and 2006, we carried out a survey of 56 HgMn stars using diffraction-limited near-infrared imaging in the Ks filter with NAOS-CONICA at the VLT. We detected thirty-three companion candidates in 24 binaries, three triples, and one quadruple system. Nine companion candidates were found for the first time in our study. Five objects are likely chance projections. The detected companion candidates have K magnitudes between 5.95 and 18.07 and angular separations ranging from below 50mas to 7.8", corresponding to linear projected separations of 13.5–1700AU. Our study clearly confirmed that HgMn stars are frequently members of binary and multiple systems. Taking into account companion candidates around ten of these stars, the multiplicity fraction in our sample may be as high as 91% (Schöller et al. 2010).

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