Comparative disk structures in a young binary star system

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Abstract

Although a large fraction of stars in our Galaxy consist of binary or higher order multiple systems, only a small number has been probed at high spatial resolution to reveal their disk structure. We report on the detection of HD35187AB, a rare 10Myr-old Herbig Ae double star, initially classified as a young debris disk, where tidal truncation may affect the disk evolution and shape the young stellar system. We combined IR and millimeter observations with VLTI/PIONIER, MATISSE and NOEMA instruments to determine the multiple disk structure from the analysis of the gaseous and dusty components. Hints of dynamical interactions are searched for to solve the discrepancy between their IR and mm morphologies. Many more binary or triple disk systems will be within reach with the increase in sensitivity of the VLTI instruments GRAVITY+ and MATISSE/GRA4MAT. Comparative studies of single versus multiple young star systems will make it possible to bring observational constraints on planet formation in such dynamically active environments.

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