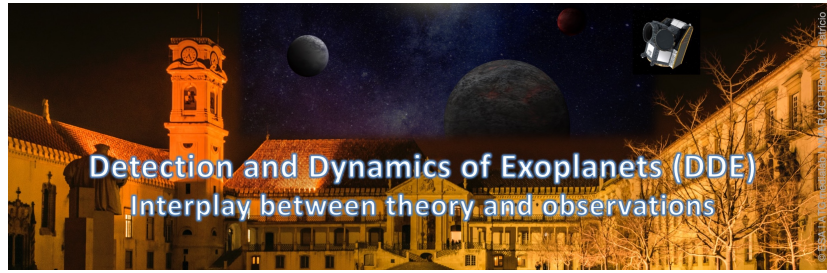


Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



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RHADaMAnTe: A code to estimate the SED of a wall of a gap opened by a planet in a protoplanetary disk

Tuesday, July 8, 2025 11:27 AM (1 minute)

When a star is born, a protoplanetary disk made of gas and dust surrounds the star. The disk can show gaps opened by different astrophysical mechanisms. The gap has a wall emitting radiation which contributes to the spectral energy distribution (SED) of the whole system (star, disk and planet) in the IR band. As these new-born stars are far away from us, it is difficult to know whether the gap is opened by a forming planet. I have developed RHADaMAnTe, a computational astro code based on the geometry of the wall gap coming from hydrodynamical 3D simulations of protoplanetary disks. With this code it is possible to make models of disks to estimate synthetic SEDs of the wall gap and prove whether the gap was opened by a forming planet. I have implemented this code to the stellar system LkCa 15. I found that a planet of 10 Jupiter masses is capable of opening a gap with a curved wall with height of 12.9AU. However, the synthetic SED does not fit to Spitzer IRS SED ($\chi^2 \sim 4.5$) from $5\mu\text{m}$ to $35\mu\text{m}$. This implies that there is an optically thick region inside the gap.

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