Contribution ID: **11** Type: **Talk**

MFBD and IFT data modeling for high-resolution high-contrast imaging

Thursday, 26 May 2022 09:20 (20 minutes)

In the context of high-contrast imaging of exoplanets in the visible band through extreme adaptive optics, the forthcoming SHARK-VIS imager for the LBT implements the concept of high-cadence imaging at millisecond frame rate, thanks to a low noise sCMOS camera that freezes the evolution of the AO residual speckles. This allows the simultaneous exploitation of both spatial and temporal information contained in the data, by means of new algorithms that we are investigating for pushing the contrast to the theoretical noise limit and achieving diffraction-limited resolution, with the final goal of detecting very faint planets at a few lambda/D separation from their host star. These algorithms do not perform a data reduction, instead they leverage on a forward data modeling of the image formation and acquisition process to reconstruct the astronomical source. I will describe and discuss two mathematical methods that we applied to real data sequences, namely the Kraken Multi-Frame Blind Deconvolution (MFBD), and the Information Field Theory (IFT).

Primary author: LI CAUSI, Gianluca (Istituto Nazionale di Astrofisica (INAF))

Presenter: LI CAUSI, Gianluca (Istituto Nazionale di Astrofisica (INAF))

Session Classification: Sessione 7