**Radial Fourier transforms in exoplanetary imaging**

**and potential uses at Timau National Observatory**

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ABSTRACT

Due to Fourier transforms nature between the field detected on the image and its corresponding input, astronomical imaging can be modelled mathematically. In exoplanetary imaging, we aim to detect exoplanets whose typical contrasts are 10-4–10-9 compared to their parent stars. Among the possible approaches to accomplish that is optical apodization, a technique to purposely modify the input signal profile such that the ‘Airy rings’ on the resulting image are suppressed while keeping the central brightness high. In the paper, we pedagogically describe this technique applying Fourier transforms of radially-symmetric functions; and investigate potential future uses at Timau National Observatory.

*Keywords: Fourier transforms; exoplanets; imaging*

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