



Intensity Interferometry with CTA and other telescopes

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The **Cherenkov Telescope Array** could be used as an **intensity interferometer!**

We have already proposed a scheme where the **Very Large Telescope** combined with the **Extremely Large Telescope** could be used in this way!

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For example:

Measuring the direction of tidal elongation of a subdwarf around a white dwarf!

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Perfect sphere

Very briefly:

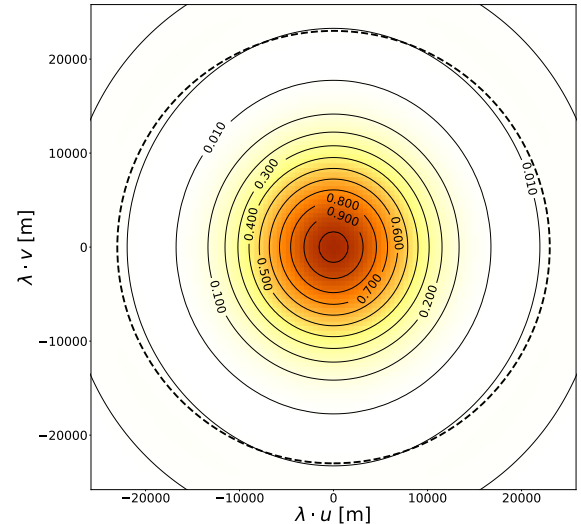
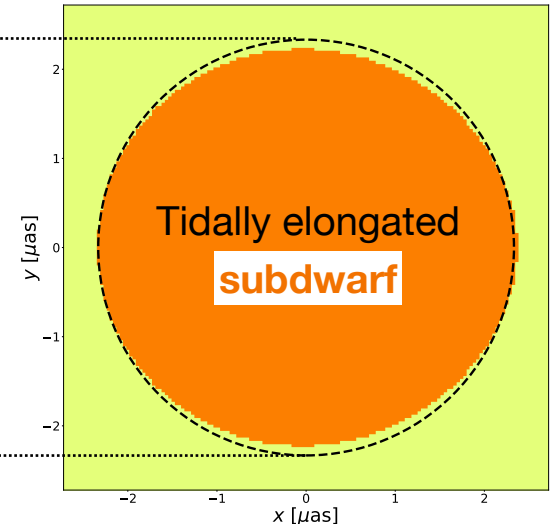
The deformation of a **subdwarf** is projected on to the Fourier plane.

In a narrow band the arrival times of photons at two distant telescopes are correlated.

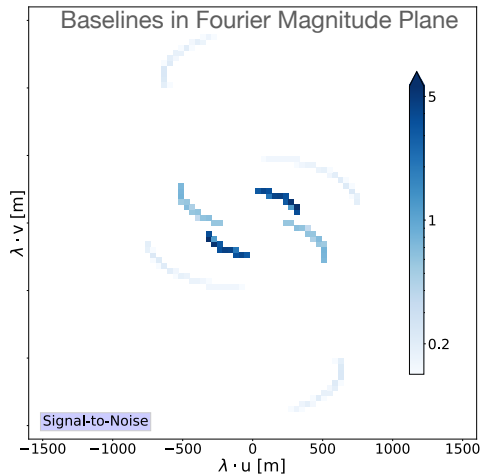
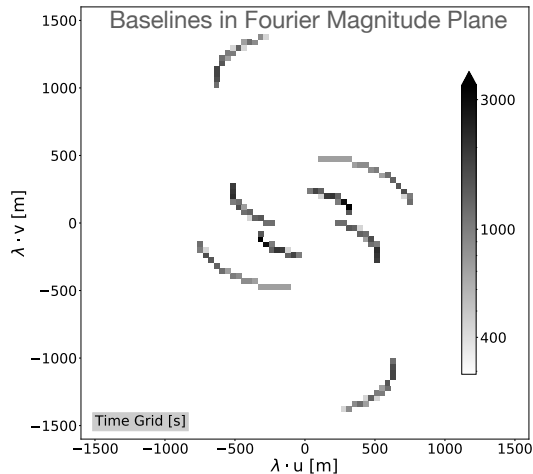
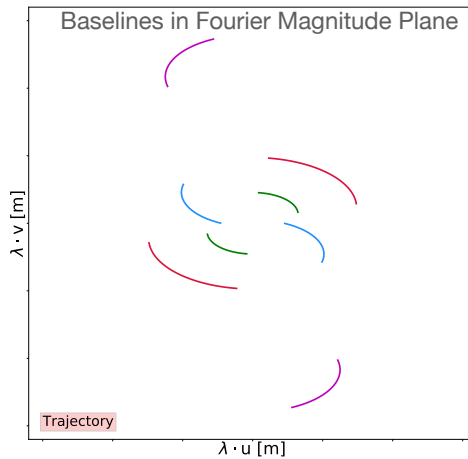
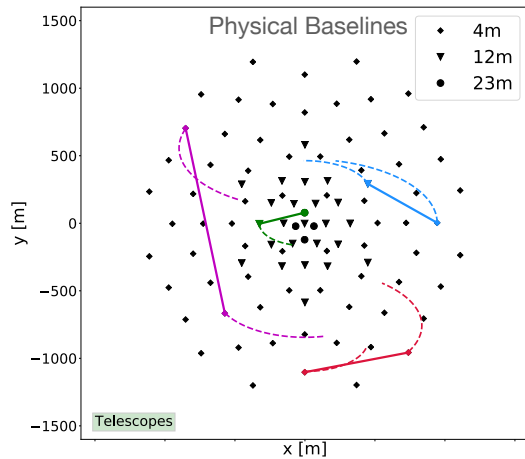
$$\langle \Delta I_1 \cdot \Delta I_2 \rangle = \langle I_1 \rangle \langle I_2 \rangle |\gamma_{12}|^2$$

The correlation is (basically...) the spatial Fourier transform of the source distribution Σ .

$$|\gamma_{12}|^2 = (\mathcal{F}[\Sigma])^2$$



Intensity Interferometry visualized:



The **Very Large Telescope** and the **Extremely Large Telescope** can be used with **CTA** as an **intensity interferometer**.

Thanks to the short baselines CTA provides, this setup would probe systems that have structure on 2 different scales.

Perhaps transiting exoplanets?
Perhaps atmospheric science?
Perhaps exomoons?
Perhaps alien spaceships?
Perhaps alien Tesla's around alien Mars'?

