

Stellar interferometry at long baseline and short wavelength (but on bright objects): recent progress in *intensity* interferometry

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Intensity interferometry is a technique developed by Hanbury Brown and Twiss in the 1950s [1] that allows measuring the absolute value of the interferometric visibility by analyzing the intensity correlations between different telescopes looking at the same target. Since it does not rely on true optical interferences, it does not need delay lines, optical recombination, adaptive optics, etc., and can therefore be used at large baseline and short wavelength and potentially with many telescopes.

After the tremendous success of the Narrabri Stellar Intensity Interferometer in the 1970s [2], this technique was abandoned due to its intrinsically very low sensitivity: large telescopes and long integration times are necessary even for bright stars.

However, the progress in photon detection (detectors, correlators) and the opportunity to use this technique on the future Cherenkov Telescope Array Observatory (CTAO) during bright moon times [3,4] has triggered a renewed and growing interest.

In this context, the last decade has seen an important revival of intensity interferometry, with a rapidly growing community, using both Cherenkov telescope arrays (VERITAS, MAGIC, HESS) and optical telescopes (our group in Nice and others) [5].

I propose to give a rapid overview of this recent progress and to present with slightly more details our current work towards a second-generation instrument using wavelength multiplexing, with the goal of measuring the angular diameter of Sirius B.

[1] **A test of a new type of stellar interferometer on Sirius**, R. Hanbury Brown & R. Q. Twiss, *Nature* **178**, 1046 (1956).

[2] **The angular diameter of 32 stars**, R. Hanbury Brown, J. Davis, L. R. Allen, *MNRAS* **167**, 121 (1974).

[3] **Optical intensity interferometry with atmospheric Cherenkov telescope arrays**, S. LeBohec & J. Holder, *ApJ*. **649**, 399 (2006).

[4] **Optical intensity interferometry with the Cherenkov Telescope Arrays**, D. Dravins, S. LeBohec, H. Jensen, P. D. Nuñez, for the CTA Consortium, *Astropart. Phys.* **43**, 331 (2013).

[5] **Stellar intensity interferometry in the photon-counting regime**, W. Guerin, M Hugbart, S. Tolila, N. Matthews, O. Lai, J.-P. Rivet, G. Labeyrie, R. Kaiser, *Comptes Rendus. Physique* **26**, 659 (2025).