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Prospects and first optical intensity interferometry results with the MAGIC and CTAO-North LST telescopes

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Along with their gamma-ray observations at very high energies (VHE, 20 GeV - 100 TeV), the two 17-m MAGIC telescopes (at Roque de los Muchachos Observatory, La Palma, Spain) have also been utilized as an optical stellar intensity interferometer (SII) for the last six years. The calibration and validation of the setup, alongside the first measurement of the stellar angular diameter of 13 early-type stars, were published in a performance paper in early 2024. Around the same time, the technical advancements developed for MAGIC were applied to the first Large-Sized Telescope of the northern hemisphere array of the Cherenkov Telescope Array Observatory (CTAO-North LST-1), a 23-m diameter telescope located near MAGIC. Three more LSTs should be completed beginning of 2026 and they may be equipped in the same manner as LST-1. We will focus on our first measurements with the MAGIC+LST-1 SII and our prospects for this and the MAGIC+LST1-4 SII for the study of several objects that are also known to emit in gamma rays: novae, such as T CrB; winds from early-type stars, particularly colliding-wind binaries; and Be stars which are typical companions of compact objects in VHE gamma-ray binaries.

Collaboration(s)

the MAGIC Collaboration, the LST Collaboration

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