[포AT-14] Optical Multi-Channel Intensity Interferometry - or: How To Resolve O-Stars in the Magellanic Clouds

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Intensity interferometry, based on the Hanbury Brown--Twiss effect, is a simple and inexpensive method for optical interferometry at microarcsecond angular resolutions. Motivated by recent technical developments, we argue that the sensitivity of large modern intensity interferometers can be improved by factors up to approximately 25,000, corresponding to 11 photometric magnitudes, compared to the pioneering Narrabri Stellar Interferometer of the 1970s when resolving. Our approach, based on spectrally resolved light, permits the construction of large optical interferometers at the cost of (very) long-baseline radio interferometers. Realistic intensity interferometers are able to spatially resolve main-sequence O-type stars in the Magellanic Clouds. Multi-channel intensity interferometers can address a wide variety of science cases: (i) linear radii, effective temperatures, and luminosities of stars; (ii) mass-radius relationships of compact stellar remnants; (iii) stellar rotation; (iv) stellar convection and the interaction of stellar photospheres and magnetic fields; (v) the structure and evolution of multiple stars; (vi) direct measurements of interstellar distances; (vii) the physics of gas accretion onto supermassive black holes; and (viii) calibration of amplitude interferometers by providing a sample of calibrator stars.