Infrared Interferometry of the Seyfert Galaxy NGC 1068

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Infrared interferometry is able to resolve the innermost region surrounding the accretion disk of AGN. H- and K-band bispectrum speckle interferometry of the nuclear region of NGC 1068 with the SAO 6 m telescope (Wittkowski et al., 1998; Weigelt et al., 2004) allowed the reconstruction of the first diffraction-limited K-band image of NGC 1068's elongated core with a resolution of 76 mas and the first H-band image with 57 mas resolution. The compact, elongated core has a north-western, tail-shaped extension. The K-band FWHM diameter of this compact core is 18 x 39 mas ($\pm$ 4 mas) or 1.3×2.8 pc, and the position angle (PA) of the north-western extension is -16 degrees. This PA is very similar to the PA of the western wall of the ionization cone. This suggests that the H- and K-band emission from the compact core is both thermal emission and scattered light from dust near the western wall of a low-density, conical cavity or from the innermost region of a parsec-scale dusty torus that is heated by the central source (the dust sublimation radius of NGC 1068 is approximately 0.1 - 1 pc). First long-baseline interferometry of NGC 1068 in the near-infrared K band (Wittkowski et al., 2004; VINCI beam combiner instrument) and in the mid-infrared (Jaffe et al., 2004; MIDI beam combiner) has been carried out with two 8.2 m Unit Telescopes of ESO's VLT Interferometer. The VINCI K-band observations show that the squared visibility amplitude of NGC 1068 is approximately 0.16 at a projected baseline of 46 m. This visibility corresponds to a substructure of less than 5 mas or 0.4 pc.

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