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Disentangling AGN and Star Formation Contributions in the Central Parsec of NGC 4945

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NGC 4945, one of the closest starburst-AGN presents a unique laboratory for testing the interplay between AGN accretion and star formation. It is the brightest extragalactic source of hard X-rays but is highly obscured below 10 keV. Its proximity allows for mapping the inner-most parsec of the galactic nucleus using very long baseline interferometry of the unobscured 22 GHz water maser emission. Combining the sub-parsec scale maser map with X-ray and infrared images of larger scale structures allows for the disentangling of contributions from the AGN and star formation. In this system, the masers are found in the thick, clumpy, circumnuclear disk as well as the shocks that trace the base of the X-ray and infrared wind. The masers pinpoint the location of the supermassive black hole and provide evidence that the wind is driven by the AGN rather than the star formation. Furthermore, some of the maser emission in the disk does not follow Keplerian rotation, indicating fragmentation and star formation in the sub-parsec scale disk.

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