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Feeding an AGN: the low-column density ISM as revealed by MeerKAT

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The recent MeerKAT deep surveys in the nearby Universe opened a new era of investigation of the neutral atomic (HI) gas in nearby galaxies. By reaching high spatial and spectral resolution with short observations, along with a large field of view (˜1 degree), MeerKAT now enables us to investigate the presence of low-column density (˜1×10^{18} cm^{-2}) HI in all types of galaxies in different environments, from isolated objects to groups and clusters. For example, observing low-column density HI from the macro (hundreds of kpc) to the micro scale (a few kpc) in active galactic nuclei (AGNs) allows us to identify and trace not only signatures of AGN-feedback (i.e. gaseous outflows) but also phenomena of cold gas accretion. In this talk, I will show recent deep HI observations (˜1×10^{18} cm^{-2}) from different MeerKAT projects (i.e. Meerkat Fornax Survey, MHON-GOOSE, open-time) of nearby radio AGNs (<100 Mpc) which allowed us to shed new light on the role of cold gas in the nuclear activity of galaxies. By using increasingly deeper MeerKAT observations I will focus on the impact of AGNs on the surrounding interstellar medium and on their triggering mechanisms, distinguishing between 'external' phenomena (i.e. mergers and interactions) and 'internal' ones (i.e. cold chaotic accretion, secular events). For some sources, I will show how events of feeding and feedback in the multi-phase gas over different scales (from ˜500 pc to 6 kpc) appear to co-exist in space and time explaining the rapid life-cycle of AGNs.

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