

Tracing the Local Void and its substructures with MeerKAT

Voids are extended low density regions. Recent studies have shown that they have substructure consisting of sub-voids, walls, tendrils, filaments and nodes. Moreover, the structure formation in voids appears to be similar to structure formation of a low density universe. Numerical simulations suggest that the galaxies in voids may preferentially lie within these filamentary void substructures. It is therefore interesting to explore whether the intricate substructure expected from hierarchical structure formation process can be traced observationally.

The Local Void is the nearest large void. Nevertheless its properties are extremely difficult to observe it since a major part of the void is located behind the Galactic bulge. In this presentation, we will present a detailed study of the Local Void and its surroundings in the ZOA using the MeerKAT Galactic Plane Survey to search for the HI-emission of Local Void galaxies within Galactic longitude and latitudes of $330 \text{ deg} < l < 55 \text{ deg}$ and $|b| < 1.5 \text{ deg}$, out to redshifts of $z < 7500 \text{ km/s}$. We find that the extent of the Void is $\sim 58 \text{ Mpc}$ at these low Galactic latitudes. We then classify the detected galaxies based on their environment and we find that the galaxies in the Void tend to have HI masses that are lower compared to average density counterparts. We also identify several small group candidates, both in the Void and at its edge. These groups in the Void show signs of filamentary substructure. We furthermore compare the small-scale clustering of the HI selected galaxies in the Void and average density regions.

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