

HectoMAP and Horizon Run 4: Over- and Under-dense Large-scale Structures in the Real and Simulated Universe

Ho Seong Hwang¹

¹*Korea Institute for Advanced Study*

HectoMAP is a dense redshift survey of red galaxies covering a 53 square degree strip of the northern sky, and Horizon Run 4 is one of the densest and largest cosmological simulations based on the standard Lambda cold dark matter model. We use HectoMAP and Horizon Run 4 to compare the physical properties of observed large-scale structures with simulated ones in the redshift range $0.22 < z < 0.58$. We find that the properties of the largest over- and under-dense structures in HectoMAP are well within the distributions for the largest structures drawn from 300 Horizon Run 4 mock surveys. Overall the size, richness and volume distributions of observed large-scale structures when the universe is ~ 9.4 Gyrs old are remarkably consistent with predictions of the standard Lambda cold dark matter model.