

Probing Neutrino Mass using the Cosmic Web

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We explore the effects of massive neutrinos and baryons on the cosmic web using the FLAMINGO simulations. With NEXUS+, we classify the cosmic web into voids, sheets, filaments, and clusters, and find that massive neutrinos affect the environment by decreasing the amount of filaments and sheets. The effect of baryons is 10% smaller. Constructing the minimum spanning tree (MST) from the haloes we find that most MST edges lie in filaments, which we link to its sensitivity to neutrino mass. The lengths of the MST edges are strongly correlated with cosmic web environments. We distinguish the effects of neutrinos from the effects of baryons on the edge lengths of the MST, emphasising its capability to go beyond two-point statistics.

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