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Title: Is Cold Gas Removed from Galaxies in Filaments and Tendrils?

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Abstract

We present results from an ALFALFA HI study to examine whether the cold gas reservoirs of galaxies are inhibited or enhanced in large-scale filaments, and we discuss implications for follow-up work using the new Arecibo Pisces-Perseus Supercluster survey (APPSS). From the ALFALFA survey, we find that the HI deficiency for galaxies in the range $10^{8.5}$ - $10^{10.5}$ solar masses decreases with distance from the filament spine, suggesting that galaxies are cut off from cold gas, possibly by heating or by dynamical detachment from the smaller-scale cosmic web. This contrasts with previous results for larger galaxies in the HI Parkes All-Sky Survey. We discuss the prospects for elucidating this apparent dependence on galaxy mass with data from the APPSS, which will extend to smaller masses. We also find that the most gas-rich galaxies at fixed local density and stellar mass are those in small, correlated "tendrils" structures within voids: although galaxies in tendrils are in significantly denser environments, on average, than galaxies in voids, they are not redder or more HI deficient. This work has been supported by NSF grants AST-1211005 and AST-1637339.

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