

# ENVIRONMENTAL TRANSFORMATIONS OF GALAXY MORPHOLOGIES IN COSMIC FILAMENTS

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We investigate whether compared to voids, galaxy filaments impose any residual effect on galaxies beyond the expected relations with the enhanced environment density [1].

We quantified the host environment of galaxies as the distance to the spine of the nearest filament, considering galaxies up to  $10 h^{-1}\text{Mpc}$  from filaments, i.e. deep inside voids. The filaments were defined by a point process (the Bisous model) from the Sloan Digital Sky Survey data release 10 [2]. In order to remove the dependence of galaxy properties on the environment density and redshift, we applied weighting to normalise the corresponding distributions of galaxy populations in each bin, after which several residual dependencies of galaxy properties still remain. Most notable is the trend of morphology transformations, resulting in an increase of the elliptical-to-spiral ratio while moving from voids towards filament spines (Fig.1).

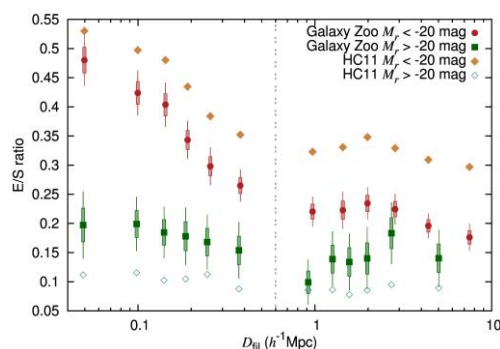


Fig.1 Elliptical-to-spiral ratio as a function of distance from filament axis.

The detected transformations can be explained by an increase in the galaxy-galaxy merger rate and/or the cut off of extragalactic gas supplies (starvation) near and inside filaments.

## References

1. T.Kuutma, A.Tamm, E.Tempel *Astronomy & Astrophysics*, submitted
2. Tempel, E., Stoica, R. S., Martínez, V. J., et al. 2014, *Monthly Notices of the Royal Astronomical Society*, 438, 3465



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