Every finite-dimensional analytic space is σ -homogeneous

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All spaces are assumed to be separable and metrizable. A space is σ -homogeneous if it can be written as the countable union of homogeneous subspaces (which we will refer to as the *witnesses*). Building on work of van Engelen, Harrington, Michalewski and Ostrovsky, we obtained the following results:

- Every finite-dimensional analytic space is σ -homogeneous with analytic witnesses,
- Every finite-dimensional analytic space is σ -homogeneous with pairwise disjoint Δ_2^1 witnesses.

Furthermore, the complexity of the witnesses is optimal in both of the above results. Together with the results of [MV], this completes the picture regarding σ -homogeneity in the finite-dimensional realm. However, it is an open problem whether every analytic space is σ -homogeneous.

References

[MV] A. MEDINI, Z. VIDNYÁNSZKY. Zero-dimensional σ-homogeneous spaces. Ann. Pure Appl. Logic. 175:1 (2024), 103331.

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