

Joint universality for shifts of the Riemann zeta function with integer multiplicities

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In 2016, Pańkowski proved that the joint universality property holds for shifts of the Riemann zeta-function with distinct positive integer multiplicities d_1 and d_2 . Namely, for any compact subsets K_j of the strip $\{s \in \mathbb{C} \mid 1/2 < \Re(s) < 1\}$ with connected complements, any non-vanishing analytic functions $f_j(s)$, and any $\varepsilon > 0$, the set of real numbers τ satisfying $|\zeta(s + id_j\tau) - f_j(s)| < \varepsilon$ uniformly in $j = 1, 2$ and $s \in K_j$ has a positive lower density.

In this talk, we will extend this joint universality result to an arbitrary number of integers under certain conditions.