

The Yang criterion for the Riemann hypothesis

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Abstract

Let $\rho(x) = x - [x]$, $\chi = \chi_{(0,1)}$. In $L_2(0, \infty)$ consider the subspace $\mathcal{B}$ generated by $\{\rho_a \mid a \geq 1\}$ where $\rho_a(x) := \rho(\frac{1}{ax})$. By the Beurling criterion the Riemann hypothesis is equivalent to the statement $\chi \in \overline{\mathcal{B}}$. This talk presents the Yang criterion for the Riemann hypothesis. This criterion generalizes the Beurling's equivalent condition by replacing the function $\chi_{(0,1)}$ with $\chi_{(a,b)}$ for any $0 \leq a < b \leq 1$.

References

- [1] A. Beurling, *A closure problem related to the Riemann zeta-function*, Proc. Nat. Acad. Sci. 41 (1955), 312-314.
- [2] J. Yang, *A generalization of Beurling's criterion for the Riemann hypothesis*, Journal of Number Theory, 164 (2016), 299-302.

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