New bounds for irrationality measure of infinite series

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For a real number ξ its irrationality measure $\mu(\xi)$ is defined as the supremum of all positive real numbers μ such that the inequality

$$0 < \left|\xi - \frac{p}{q}\right| < \frac{1}{q^{\mu}}$$

has infinitely many solutions $p \in \mathbb{Z}$, $q \in \mathbb{Z}^{+}$. Irrationality measure describes how closely the number ξ can be approximated by rational numbers. All irrational numbers ξ have irrationality measure $\mu(\xi) \geq 2$. A famous result of Roth is that all algebraic irrational numbers ξ have irrationality measure $\mu(\xi) = 2$.

In the talk we present new lower and upper bounds for irrationality measure of infinite series of rational numbers. Our results depend only on the speed of convergence of the series and do not depend on arithmetical properties of the terms.