Bundschuh, Peter; Zudilin, Wadim

Rational approximations to a q-analogue of π and some other q-series. (English)

Zbl 1213.11146

Schlickewei, Hans Peter (ed.) et al., Diophantine approximation. Festschrift for Wolfgang Schmidt. Based on lectures given at a conference at the Erwin Schrödinger Institute, Vienna, Austria, 2003. Wien: Springer (ISBN 978-3-211-74279-2/hbk). Developments in Mathematics 16, 123-139 (2008).

The paper deals with the irrationality and the upper bound for the irrationality exponent of the sum of the q-series $x\sum_{n=1}^{\infty}\frac{z^n}{p^n-x}$ where $q=p^{-1}$, $p\in\mathbb{Z}\setminus\{0,1,-1\}$, $x\in\mathbb{Q}$, $z\in\mathbb{Q}$ and under the other certain conditions for p, x and z. As an application the authors derive the upper bound for the irrationality exponent of π_q which is the q-analog of π. The proofs make use several properties of hypergeometric and integral constructions.

For the entire collection see [Zbl 1143.11004].

Reviewer: Jaroslav Hančl (Ostrava)

MSC:

11J72	Irrationality; linear independence over a field
11J82	Measures of irrationality and of transcendence
33D15	Basic hypergeometric functions in one variable, ${}_r\phi_s$

Keywords:

q-series; irrationality; q-analog of π