
0901.33009

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Parameter augmentation for basic hypergeometric series. II. (English)

J. Comb. Theory, Ser. A 80, No.2, 175-195 (1997). [ISSN 0097-3165]
http://www.elsevier.com/locate/issn/00973165

[For part I see the authors in Prog. Math. 161, 111-129 (1998; Zbl 0901.33008).]
Let D_q be the q-difference operator, $D_q f(a) = (f(a) - f(aq))/a$, and define an exponential operator T by

$$T(bD_q) = \sum_{n=0}^{\infty} \frac{(bD_q)^n}{(q;q)_n}.$$

The authors derive many known results by applying this operator to simpler results. As an example, they obtain the Askey-Wilson integral by applying this operator three times to the integral identity

$$\int_0^{\pi} \frac{(e^{2i\theta}, e^{-2i\theta}; q)_\infty}{(ae^{i\theta}, ae^{-i\theta}; q)_\infty} d\theta = \frac{2\pi}{(q;q)_\infty}.$$

A fourth application of their operator yields the Ismail-Stanton-Viennot integral which implies the Nassrallah-Rahman integral. Their technique also yields a particularly simple proof of the linearization formula for the Rogers-Szegő polynomials.

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Keywords : difference operator; Nassrallah-Rahman integral

Classification :

- ∗33D20 Generalized basic hypergeometric series
- 05A30 q-calculus and related topics
- 05A19 Combinatorial identities
- 05E35 Orthogonal polynomials (combinatorics)

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