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A uniform proof of the Macdonald-Mehta-Opdam identity for finite Coxeter groups. (English) Zbl 1230.33011

Summary: We give a new proof of the Macdonald-Mehta-Opdam integral identity for finite Coxeter groups (in the equal parameter case). This identity was conjectured by Macdonald and proved by E. M. Opdam [in Invent. Math. 98, No. 1, 1–18 (1989; Zbl 0696.33006), Compos. Math. 85, No. 3, 333–373 (1993; Zbl 0778.33009)] using the theory of multivariable Bessel functions, but in non-crystallographic cases the proof relied on a computer calculation by F. Garvan. Our proof is somewhat more elementary (in particular, it does not use multivariable Bessel functions), and uniform (does not refer to the classification of finite Coxeter groups).

MSC:
33D67 Basic hypergeometric functions associated with root systems
05E15 Combinatorial aspects of groups and algebras (MSC2010)
20F55 Reflection and Coxeter groups (group-theoretic aspects)

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