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E. Feigin
Independent University, Bolshoy Vlasievsky 11, 119002 Moscow, Russia
evgfeig@mccme.ru

Infinite Fusion Products and $\widehat{\mathfrak{sl}_2}$ Cosets

We study an approximation of tensor product of irreducible integrable $\widehat{\mathfrak{sl}_2}$ representations by infinite fusion products. This gives an approximation of the corresponding coset theories. As an application we represent characters of spaces of these theories as limits of certain restricted Kostka polynomials. This leads to the bosonic (which is known) and fermionic (which is new) formulas for the $\widehat{\mathfrak{sl}_2}$ branching functions.

Keywords: Cosets, branching functions, Kostka polynomials.

MSC: 17B67, 81R10