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ON CERTAIN TRANSFORMATIONS OF BASIC HYPERGEOMETRIC FUNCTIONS USING BAILEY'S TRANSFORM

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Dedicated to Prof. K. Srinivasa Rao on his 75^{th} Birth Anniversary

Abstract: In this paper, making use of Bailey transform and certain known summation formulas, we have established certain interesting transformation formulas of basic hypergeometric series.

Keywords and Phrases: Basic hypergeometric series, Bailey's pair and Bailey's transformation.

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1. Introduction

The generalized basic hyper geometric series ${}_r\phi_s$ is defined by

$$ {}_r\phi_s\left[\begin{matrix} a_1, a_2, \ldots, a_r \\ \\ b_1, b_2, \ldots, b_s \end{matrix} ; q, z\right] = \sum_{n=0}^{\infty} \frac{(a_1, a_2, \ldots, a_n)_n}{(q, b_1, b_2, \ldots, b_n)_n} [(-1)^n q^{n(n-1)/2}]^{1+s-r} z^n \quad (1.1) $$

where r and s are positive integers and $|q| < 1$. The above series converges absolutely for all z if $r \leq s$ and for $|z| < 1$ if $r = s + 1$.
For real or complex a, $q < 1$, the q -shifted factorial is defined by

$$ (a, q)_n = \begin{cases} 1 & \text{if } n = 0; \\ (1-a)(1-aq)(1-aq^2)\ldots,(1-aq^{n-1}) & \text{if } n \in N. \end{cases} \quad (1.2) $$