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On Bailey's Transform and Expansion of Basic Hypergeometric Functions-II

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Abstract: In a recent communication we dealt with a new technique to establish expansions of basic hypergeometric functions with the help of Bailey's transform and certain known transformations of truncated hypergeometric series. These results do not look possible directly with the help of the traditional method. This is the continuation of the above study. Certain interesting special cases have also been deduced.
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1. Introduction, Notations and Definitions

For $|q| < 1$ and α, real or complex, let

$$[\alpha; q]_n \equiv [\alpha]_n = \begin{cases} (1-\alpha)(1-\alpha q)(1-\alpha q^2)...(1-\alpha q^{n-1}); & n > 0 \\ 1 & ; \quad n = 0 \end{cases} \tag{1.1}$$

Accordingly,

$$[\alpha; q]_\infty = \prod_{n=0}^{\infty}(1-\alpha q^n)$$

Also,

$$[a_1, a_2, a_3, ..., a_r; q]_n = [a_1; q]_n[a_2; q]_n[a_3; q]_n...[a_r; q]_n. \tag{1.2}$$

Now, we define a basic hypergeometric function

$${}_r\Phi_s\left[\begin{matrix} a_1, a_2, ..., a_r; q; z \\ b_1, b_2, ..., b_s; q^\lambda \end{matrix}\right] = \sum_{n=0}^{\infty}\frac{[a_1, a_2, ..., a_r; q]_n z^n q^{\lambda n(n-1)/2}}{[q, b_1, b_2, ..., b_s; q]_n} \tag{1.3}$$