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# ON CERTAIN SUMMATION FORMULAE FOR $q$-HYPERGEOMETRIC SERIES

**Vijay Yadav**

Department of Mathematics,
SPDT College, Andheri (E) Mumbai-400059, INDIA

E-mail : vijaychottu@yahoo.com

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**Abstract:** In this paper, making use of a transformation formula of basic bilateral $q$ series due to Bailey, certain summation formulae of basic bilateral series have been established.

**Keywords and Phrases:** $q$-hypergeometric series, $q$-bilateral hypergeometric series, transformation formula, summation formula.

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## 1. Introduction, Notations and Definitions

Let $q$ be a fixed complex parameter with $0 < |q| < 1$. The $q-$ shifted factorial is defined for any complex parameter '$a$' by

$$(a;q)_\infty = \prod_{r=0}^{\infty}(1-aq^r), \quad (a;q)_k = \frac{(a;q)_\infty}{(aq^k;q)_\infty},$$

where $k$ is any integer.
For brevity, we write

$$(a_1, a_2, ..., a_r; q)_n = (a_1; q)_n(a_2; q)_n...(a_r; q)_n.$$

Further, recall the definition of basic hypergeometric series

$${}_r\Phi_{r-1}\left[\begin{array}{l} a_1, a_2, ..., a_r; q; z \\ b_1, b_2, ..., b_{r-1} \end{array}\right] = \sum_{n=0}^{\infty} \frac{(a_1, a_2, ..., a_r; q)_n z^n}{(q, b_1, b_2, ..., b_{r-1}; q)_n}, \tag{1.1}$$