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A DIRECT PROOF OF THE AAB-BAILEY LATTICE

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

Abstract: The purpose of this paper is to give a direct proof of AAB-Bailey lattice.

Keywords and Phrases: Bailey pair, identity, AAB Bailey lattice.

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1. Introduction

First recall some standard basic hypergeometric notation [8]. For two indeterminate q and x with $|q| < 1$, let

$$(x;q)_\infty == \prod_{n=1}^{\infty}(1-xq^{n-1}),$$

which can be used to define the following shifted factorial:

$$(x;q)_n = \frac{(x;q)_\infty}{(xq^n;q)_\infty}.$$

The multiple parameter form is abbreviated as

$$(x_1, x_2, \cdots, x_k; q)_n = (x_1;q)_n(x_2;q)\cdots(x_k;q)_n.$$

The basic hypergeometric series ${}_r\phi_s$ is defined by

$${}_r\phi_s\left[\begin{matrix}\alpha_1, & \ldots, & \alpha_r\\ \beta_1, & \ldots, & \beta_s\end{matrix}\Bigg| q, z\right] = \sum_{n=0}^{\infty}\frac{(\alpha_1,\alpha_2,\cdots\alpha_r;q)_n}{(q,\beta_1,\cdots,\beta_s;q)_n}\{(-1)^n q^{\binom{n}{2}}\}^{1+s-r}z^n.$$