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Some remarks on very-well-poised $8\phi_7$ series

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Nonpolynomial basic hypergeometric eigenfunctions of the second order Askey-Wilson difference operator are known to be expressible as very-well-poised $8\phi_7$ series. In this paper we use this fact to derive various basic hypergeometric and theta function identities. We relate most of them to identities from the existing literature on basic hypergeometric series. This leads for example to a new derivation of a known quadratic transformation formula for very-well-poised $8\phi_7$ series. We also provide a link to Chalykh's theory on (rank one, BC type) Baker-Akhiezer functions.

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