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A NOTE ON AN IDENTITY FOR THE DOUBLE SERIES WITH APPLICATIONS

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Abstract: Owing to the remarkable success of the hypergeometric function of one variable, the authors present a study of some family of hypergeometric functions of two variables (for example Kampé de Fériet's hypergeometric functions in two variables). The main aim of this paper is to provide several (presumably new) summation formulas for appropriately specified numerator and denominator parameters of the family in double hypergeometric functions having two equal arguments such as: $\frac{-1}{2}$, $\frac{1-\sqrt{2}}{2}$, $\frac{\pm 1}{3}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{2-\sqrt{3}}{4}$, $\frac{-1}{8}$, $\frac{4-3\sqrt{2}}{8}$, $\frac{1}{9}$, $\frac{8}{9}$, $\frac{\sqrt{2}-1}{\sqrt{2}+1}$, $2\sqrt{2}-2$ and $12\sqrt{2}-16$. The methodology and techniques which are used in this paper, are based upon general double series identity obtained by using two-balanced summation theorem associated with Clausen hypergeometric polynomial with argument unity.

Keywords and Phrases: Kampé de Fériet's general double hypergeometric function; Cauchy's double series identity; Gamma function; Series rearrangement technique.

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