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Vijay Jung Kunwar* (vijay.kunwar@asurams.edu) and **Mark van Hoeij** (hoeij@math.fsu.edu). *Solving Second Order Linear Differential Equations with Five Regular Singularities.*

Hypergeometric functions play a significant role on solving linear differential equations with regular singularities. Gauss hypergeometric function, also known as ${}_2F_1$ function, is a solution of the second order linear differential equation:

$x(1-x)y'' + (c - (a+b+1)x)y' - aby = 0$, also called Gauss hypergeometric differential equation which has 3 regular singularities at $x = 0, 1, \text{ and } \infty$. Based on this property, we develop algorithms to find hypergeometric solutions of differential equations which have (i) n regular singularities, or (ii) solutions with specific degree d .

In this presentation we will talk about our algorithm designed to find hypergeometric solutions of second order linear differential equations with 5 regular singularities, at least one logarithmic. (Received September 20, 2016)