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On a Hankel transform integral.

Let x and v be complex variables, $\Gamma(x)$ the Gamma function, and $(x)_v = \frac{\Gamma(x+v)}{\Gamma(x)}$ for any complex v the generalized Pochhammer symbol. The principal aim of the paper is to investigate new integral expression

$$\int_0^{\infty} x^{s-1} e^{-\sigma x^2} L_m^{(\gamma, \delta)}(\sigma x^2) L_n^{(\alpha, \beta)}(\sigma x^2) J_s(xy) dx,$$

where $\alpha, \beta, \gamma, \delta$ and $s \in \mathbb{C}^*$; $\mathbb{C}^* = \{x/x \in \mathbb{C} \ \& \ Re(x) > -1\}$, $\sigma \in \mathbb{C}$ with $Re(\sigma) > 0$, $y \in \mathbb{R}^+$ and

$$L_n^{(\alpha, \beta)}(x) = \frac{\Gamma(\alpha n + \beta + 1)}{\Gamma(n + 1)} \sum_{k=0}^n \frac{(-n)_k x^k}{k! \Gamma(\alpha k + \beta + 1)}.$$

Some special cases have been obtained. (Received January 15, 2010)