Surveys in Mathematics and its Applications

ISSN 1842-6298 (electronic), 1843-7265 (print)
Volume 11 (2016), 1 – 9

ON A NEW CLASS OF INTEGRALS INVOLVING GENERALIZED MITTAG-LEFFLER FUNCTION

Naresh Menaria, Sunil Dutt Purohit and Rakesh K. Parmar

Abstract. In this paper, we aim at establishing two generalized integral formulae involving generalized Mittag-Leffler function which are expressed in terms of the generalized hypergeometric function and generalized (Wright) hypergeometric function. Some interesting special cases of our main results are also considered. The results are derived with the help of an interesting integral due to Lavoie and Trottier.

Full text

References

[1] P. Agarwal, S. Jain, S. Agarwaland M. Nagpal, *On a new class of integrals involving Bessel functions of the first kind*, ISPACS, **2014** (2014), 1-7.

[2] J. Choi, A. Hasanov, H. M. Srivastava and M. Turaev, *Integral representations for Srivastava's triple hypergeometric functions*, *Taiwanese J. Math*, **15**(2011), 2751-2762. MR2896142. Zbl 1250.33009.

[3] C. Fox, *The asymptotic expansion of generalized hypergeometric functions*, Proc. London Math. Soc, **27**(1928), 389-400. MR1575398. JFM 54.0392.03.

[4] J. L. Lavoie and G. Trottier, *On the sum of certain Appell's series*, Ganita, **20** (1969), 43-46. MR0267147. Zbl 0208.08201.

[5] G. M. Mittag-Leffler, *Sur la nouvelle fonction* $E_\alpha(x)$, C. R. Acad. Sci. Paris **137** (1903), 554-558.

[6] F. W. L. Olver, D. W. Lozier, R. F. Boisvert and C. W. Clark, *NIST Handbook of Mathematical Functions*, Cambridge University Press, 2010. MR2723248(2012a:33001). Zbl 1198.00002.

2010 Mathematics Subject Classification: 33C05; 33C20; 33C70.

Keywords: Gamma function; Generalized hypergeometric function ${}_pF_q$; Generalized (Wright) hypergeometric functions ${}_p\Psi_q$; Generalized Mittag-Leffler functions; Lavoie-Trottier integral formula.

[7] T.R. Prabhakar, *A singular integral equation with a generalized Mittag-Leffler function in the kernel*, Yokohama Math. J. **19** (1971), 7-15. MR0293349. Zbl 0221.45003.

[8] M. A. Rakha, A. K. Rathie, M. P. Chaudhary and S. Ali, *On A New Class of integrals involving hypergeometric function*, J. Inequal. Spec. Funct., **3**(2012), 10-27. MR2914525. Zbl 1312.33013.

[9] A. K. Shukla and J. C. Prajapati, *On a generalization of Mittag-Leffler function and its properties*, J. Math. Anal. Appl., **336**(2007), 797-811. MR2352981(2008m:33055). Zbl 1122.33017.

[10] H. M. Srivastava and P. W. Karlsson, *Multiple Gaussian Hypergeometric Series*, Halsted Press (Ellis Horwood Limited, Chichester), John Wiley and Sons, New York, Chichester, Brisbane, and Toronto, 1985. MR0834385(87f:33015). Zbl 0552.33001.

[11] A. Wiman, *Über den fundamental Satz in der Theorie der Funktionen* $E_\alpha(x)$, Acta Math. **29**(1905), 191-201. MR1555014. JFM 36.0471.01.

[12] E. M. Wright, *The asymptotic expansion of the generalized hypergeometric functions*, J. London Math. Soc, **10**(1935), 286-293.

[13] E. M. Wright, *The asymptotic expansion of integral functions defined by Taylor series*, Philos. Trans. Roy. Soc. London, A. **238**(1940), 423-451. MR0001296. Zbl 0023.14002.

[14] E. M. Wright, *The asymptotic expansion of the generalized hypergeometric function II*, Proc. London Math. Soc., **46**(1940), 389-408. MR0003876.

Naresh Menaria
Department of Mathematics, Pacific college of Engineering, Udaipur-313001,
Rajasthan, India.
e-mail: naresh.menaria14@gmail.com

Sunil Dutt Purohit
Department of HEAS (Mathematics), Rajasthan Technical University, Kota-324010,
Rajasthan, India.
sunil_a_purohit@yahoo.com

Rakesh K. Parmar
Department of Mathematics, Govt. College of Engineering and Technology, Bikaner-334004,
Rajasthan, India.
e-mail: rakeshparmar27@gmail.com

License