

A unified approach to the integrals of Mellin-Barnes-Hecke

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We discuss a unified approach to a family of integrals of the Barnes Mellin type which are of interest in number theory using the theory of distributions. Interesting features arise in many of the cases which call for the application of pull-backs of distributions via smooth submersive maps defined by Hormander. We derive by this method the integrals of Hecke and Sonine relating to various types of Bessel functions which have found applications in in analytic and algebraic number theory.