

STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS
DEPARTMENTAL SEMINAR

4:15 p.m., Tuesday, August 7, 2001
Sequoia Hall Rm. 200
(Cookies at 3:45 in 1st Floor Lounge)

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Functionals of Dirichlet Processes and Multiple Hypergeometric Functions

Given a Dirichlet process D – with parameter α – some issues, related to the probability distribution (p.d.) μ_α of the random integral $\tilde{d} = \int_R xD(dx)$, are discussed. In particular, the Lauricella theory of multiple hypergeometric functions (1893) is taken as a starting point to establish – in a very simple way – a relation between a transform of the Stieltjes type of μ_α and the characteristic function of $\tilde{g} = \int xG(dx)$, G being a gamma process with parameter α . Such a relation represents a substantial extension of an identity, given by Cifarelli and Regazzini more than twenty years ago, recently referred to as Markov-Krein identity. Here, this relation is used to state a one-to-one correspondence between α and μ_α . Subsequently it is shown that it allows a plain determination of explicit formulas for μ_α . Moreover, after observing that the p.d. of \tilde{g} is infinitely divisible, the corresponding Lévy measure is used to verify absolute continuity of μ_α . Finally, an explicit formula for the characteristic function of \tilde{d} is provided, connected with a confluent form of the Lauricella fourth function. This formula is applied to show that μ_α is symmetric if and only if α is symmetric.