Probabilistic Operator Algebra Seminar

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Title: *Spectral densities for spectral triples*

To any densely defined self-adjoint nonnegative operator L on a Hilbert space which has discrete spectrum away from its kernel, we associate a density $\rho(L)$ lying in the dual Macaev ideal $\mathcal{L}^{1,\infty}(H)$. We give simple criteria involving only the spectral multiplicities of L for $\rho(L)$ having a nonzero singular trace and in particular for having $\mathrm{Tr}_\omega(\rho(L)) = 1$. We study then the existence of meromorphic extensions for the ζ-*function* of $L : \zeta_L(s) = Tr(\rho(L)^s)$ in some half plane $\mathrm{Re}(s) > \alpha$ with $\alpha < 1$. Applying these to $L = |D|$ where D is the Dirac operator of some spectral triple (H, A, D) we provide sufficient conditions for the volume form $\Omega : \Omega(T) = \mathrm{Tr}_\omega(T\rho(L))$ on $B(H)$ to be a hypertrace.