Rigged Hilbert spaces, Distribution Frames and (some aspects of) Spectral Analysis of Operators

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Abstract: Rigged Hilbert spaces (RHS), or Gelfand triplets, play an important role in the mathematical formulation of Quantum Mechanics. As discussed by several authors (Roberts, Antoine, Bohm, Gadella,...), they help in solving some problem posed by the Dirac formalism but they also pose several questions from a mathematical perspective. In this talk, after a short review on RHS′s and operators on them, we will focus our attention on the spectral behavior of a self-adjoint operator A in Hilbert space, which can be espressed in terms of generalized eigenvectors (in the sense of the theorem of Gelfand-Maurin). In particular, we explore condition for A to have simple spectrum. This analysis makes use of some *distribution frame*, a generalization to RHS of the notion of *frame* in Hilbert space.

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