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Double Spectrum Digraph of Quantum Group Gravity

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We establish the unitary representation theory of quantum group gravity.

(i) A dual pair of nonlinear diffusion equations are presented, first describes the growth phase transition process (as universe expansion); second describes the descent process (as Hall effect). These exactly analytical solutions explain the explicate and implicate physical causality, structure and law of dual quantum groups under nature gravity effects. We prove that nonlinear and linear operators are isomorphism under complex manifolds, then are connect, then some nonlinear diffusion equations are exactly solvable.

(ii) Using the Gelfand Mapping, we construct an exactly quantitative double spectrum digraph (DSD) of gravity phase evolution and coherent process, which reveal the essential detail of the phase transition (coherent) as: spectrums of graviton operator, three levels of gravity energies, three phase transition orbits. This model discovers the relationships between the mass, spin and graviton, determines the phase change limitations for particle and cosmology scales.

(iii) This DSD model just is a modern mathematical physics version of an ancient mysterious FuXi Hexagram, by which we exactly predict some fundamental physics constants, such as, Hubble parameter, Planck constant, dark energy density, Newtonian gravitational constant. These results deepen the understand of gravity and Nature.

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