The concept of hierarchical lattice and hierarchical distance was proposed by F.J. Dyson in his famous paper on the phase transition for 1**D** ferromagnetic model with long range interaction (1969). The notion of the hierarchical Laplacian which is closely related to the Dyson's model was studied in several mathematical papers during the last forty years. These papers contain some basic information about the hierarchical Laplacian (the spectrum, the Markov semigroup, resolvent etc) in the case when the state space is discrete and the hierarchical lattice satisfies some symmetry conditions (homogenuity, self-similarity etc). Under these symmetry conditions the state space can be identified with some discrete infinitely generated Abelian group equipped with a translation invariant ultrametric. The corresponding Markov semigroup is symmetric, translation invariant and isotropic. In particular, the spectrum of the hierarchical Laplacian is pure point and all eigenvalues have infinite multiplicity.

The main goal of the papers mentioned above was to study the corresponding Anderson Hamiltonian, which equals the hierarhical Laplacian plus some random potential. There was a hope to detect for such operators the spectral bifurcation from the pure point spectrum to the continuous one, i.e. to justify the famous Anderson conjecture. Unfortunately, the true result was opposite: under mild technical conditions the hierarchical Anderson Hamiltonian has a pure point spectrum - the so-called phenomenon of localization. Moreover, the local statistics of the spectrum is Poissonian, which is always deemed a manifistation of the spectral localization.

A systematic study of a class of isotropic Markov semigroups defined on an ultrametric measure space has been done in the recent paper of Bendikov, Grigor'yan, Pittet and Woess. This study has been motivated by Random walks on infinitely generated groups - the classical subject which can be traced back to the pioneering works of Erdös, Spitzer, Kesten, Molchanov, Lawler and others. It turned out that the two mentioned above studies are closely related to each other. Namely, given an isotropic Markov semigroup defined on an ultrametric measure space with minus Markov generator, one can show that the minus generator coincides with the hierarchical Laplacian associated with appropriately defined choice-function, and vice versa.
In the project we introduce a new class of operators: the *random hierarchical Laplacians*, which demonstrate several new spectral effects.
The spectrum of such operators is still pure point but in contrast to the deterministic case there exists the continuous density of states. This density detects the spectral bifurcation from the pure point spectrum to the continuous one. The eigenvalues form locally a Poissonian point process with intensity given by the density of states.

In the project we study quantitatively (with respect to the Kolmogorov or Wesserstein metric) convergence - of the arithmetic means of the eigenvalues of perturbated hierarchical Laplacian - to the standard normal random variable. We introduce the empirical point process corresponding to (perturbated) eigenvalues and, assuming that the density of states exists and is continuous, we will prove that the finite-dimensional distributions of this process converge to the finite-dimensional distributions of the Poisson point process. We will also estimate the rate of the Poisson convergence in terms of the total variation metric.

In our study we plan to apply the classical method of characteristic functions as well as the Chen-Stein's method of characterizing operators.

As an example we will consider Bernoulli perturbations of the Taibleson-Vladimirov operator of fractional derivative deined on the ring of p-adic numbers.