



Contribution ID: 26

Type: not specified

Spontaneous Wave Function Collapse

A number of interpretations/extensions of quantum mechanics have been proposed to attempt to solve the quantum measurement problem. Among these there are dynamical models for the collapse of the wave function. Stochastic processes for the spontaneous collapse of a quantum state were first proposed in PRD34(1986)470, marking Pavia as one of the birth places of such models.

Subsequently many extensions of this model have been proposed, and it was shown that continuous models for the collapse can be obtained from discrete ones, in an appropriate limit. In all these processes in Hilbert space a set of physical quantities (observables) appears, represented by the corresponding set of self-adjoint operators. The processes act by inducing the sharpening of the distribution of values of those quantities around a stochastically chosen center.

Research in this area continues, and experiments have put a number of constraints on the value of the parameters of the models.

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Session Classification: Caffè e poster (dal N. 9 al N. 51)