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ON OBSERVATION OF POSITION IN QUANTUM THEORY

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Newtonian and Schrodinger dynamics can be formulated in a physically meaningful way within the same Hilbert space framework. This fa was recently used to discover an unexpected relation between classical and quantum motions that goes beyond the results provided by t Ehrenfest theorem. A formula relating the normal probability distribution and the born rule was also found. Here the dynamical mechanism responsible for the latter formula is proposed and applied to measurements of macroscopic and microscopic systems. A relationship between the classical Brownian motion and the diffusion of state on the space of states is discovered. The role of measuring devices quantum theory is investigated in the new framework. It is shown that the so-called collapse of the wave function is not measure me specific and does not require a "concentration" near the Eigen states of the measured observable. Instead, it is explained by the comm diffusion of state over the space of states under interaction with the apparatus and the environment. This in turn provides us with a bas reason for the definite position of macroscopic bodies in space.