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“Walking on quantum foundations”

The only point of contact between the quantum formalism and reality lies in measurements. Studying quantum measurement means to model the apparatus A and solve the dynamics of when it is coupled to the tested system S . It appears that measurement goes in three steps. First the off-diagonal elements decay by dephasing and decoherence, in a cascade of multiparticle correlations between S and A . The second step is the registration, where the pointer goes from its initial metastable state to one of the stable states. The third step, subensemble relaxation, is a new mechanism which acts near the end of the measurement inside A . Weak postulates are formulated to connect to individual measurements, thus narrowing the measurement problem.

If time permits I will give details on employing lensing data of a galaxy cluster to predict a neutrino mass of 1.86 eV and their Dirac nature.

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