

Summary

Several properties that might be attributed to measurement have been described and examined with respect to whether or not they can be used to distinguish measurement from unitary evolution. As has been seen, what one might have initially thought to be a strictly measurement effect may have a perfectly reasonable explanation in the unitary domain.

What has been found is that it is not a simple matter to discern unitary evolution from measurement in a scientifically valid method, and hence tackling the measurement problem both theoretically and experimentally clearly requires a serious effort. The many subtleties of the measurement problem have led to a substantial number of statements regarding the measurement problem that are either outright wrong, or for which we would consider to be scientific hypotheses at this point, yet have often been published as a matter of fact by many peer-reviewed journals.

Many statements by researchers are contrary to what is required to be established via scientific methodology and have no place in any scientific journal. There appear to be two extremes of such reporting. On the one hand, there are many who claim that all particles evolve unitarily. Such a claim is contrary to what has been presented in Chapter 3 and is similar to the spreading of political propaganda. Strong statements that are not scientifically validated only spread confusion, and publication of such statements has no part in the scientific process and we suggest should be rejected out of hand. On the other hand, if one is investigating the measurement problem and believes that one has a contribution to make, then one has a responsibility not to go overboard as well. That is, a signature of measurement may very well be a signature of unitary evolution.

In either case, due to the subtleties and experimental difficulties surrounding this problem, one should be extra careful when investigating and reporting on results regarding the measurement problem.