Review of: "Quantum Mechanical and Classic Measurement Result Quantities are Equal (Even though their Numerical Values are Not)"

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Potential competing interests: No potential competing interests to declare.

I am not qualified to make a thorough review of this paper, but I have read it and have some comments from my position that might be of interest for the author to consider.

First, I would suggest that the author considers the “Ontology on properties for physical, chemical and biological systems“ by Dr René Dybkaer. It is available at https://ontology.iupac.org/.

We understand “quantity” as a measurable property and recognize results of ordinal, difference, and rational scales in contrast to nominal properties.

We further recognize systematic errors (variation) and random errors (variation); the corresponding quantities are trueness and precision. We avoid the expression “error” and prefer to express a result as the best estimate and an interval within which the true value is expected with a given probability. Generally, we assume that results of measurements are normally (Gaussian) distributed. It is often justified to separately identify measurement results as obtained under repeatability- and reproducibility conditions as well as intermediary conditions. Consequently the uncertainty can be expressed as standard deviation and the variances added to obtain a combined uncertainty, often referred toa as ”total”. I believe this is compatible with the “Heisenberg thinking”.

We usually claim that units are singular, and I believe the author expresses this indirectly several times in the text. Thus, “two dollars” represents two dollar coins or bank notes whereas “two dollar “ is the property “ value”. The author would use the expression n x u.

In our world the abbreviation u and U are used for uncertainty and expanded uncertainty, respectively (see BIPM GUM)

In most science we do not measure the property directly, we measure the measurand, i.e. the quantity intended (cf BIPM :GUM and VIM) thus, we measure a surrogate signal, e.g. light absorbance; and estimate the substance concentration of the measured using a suitable calibration function.