Philosophical Derivation(?) of the 'Presentist Fragmentalist' interpretation of quantum mechanics

A. I would like to give the basic reasoning of a philosophical derivation, as opposed to a philosophical justification, of the Presentist Fragmentalist interpretation of quantum mechanics explicated elsewhere [1]. There is almost no math in this brief note.

Here is the idea in perhaps its most basic form:

1. If we are both looking at a 'red' fire truck, it cannot be verified that my phenomenal red is the same as your phenomenal red. I.e. I might experience what you would call 'blue' when I look at the fire truck.

2. McTaggart's A-series (future/present/past) is phenomenal.

$\therefore$ It cannot be verified that my A-series is the same as your A-series.

That's it.

B. Of course this could be elaborated on to make it more clear that this is a basis for a robust interpretation of quantum mechanics.

3. It accords with (1), (2), and the conclusion above, that there is indeed no fact-of-the-matter *ontologically* as to whether we see the same red or not. Note that as there is no experimentally observable fact-of-the-matter about this and that should be encoded in the ontology.

4. With respect to (1) and the conclusion, the problem of anthropocentrism is removed by supposing this inference applies to each quantum system—no matter how small, simple, or non-local (non-local in the spatial variables of a different quantum system).

5. A quantum system q1 has can serve as a quantum reference frame from which to describe quantum system q2, and *vice versa*.

6. Reality is *fragmented* into fragments given by each quantum system. If quantum system q1, which forms a fragment, has a value of a parameter a1, another quantum system q2, which forms another fragment, does not have a value for the corresponding parameter a2, and *vice versa*.

7. With respect to the conclusion, fragment f1 has an A-series, and fragment f2 has a different A-series. But there is no fact-of-the-matter as to whether the values of these two A-series are the same. For example, a 'present' may be defined in (or from the perspective of) f1, but then it is undefined in f2, and *vice versa*. This takes some getting used to but it is, I would claim, more satisfactory than the received implication of special relativity that there *is* no present.

8. With respect to (7), *within* each fragment there are *five* coordinates, τ the A-series time coordinate, t the B-series time coordinate, and x^a the three spatial coordinates, and not *four* coordinates, as in

Minkowski space, t the B-series time coordinate, and x^a the three spatial coordinates. Ultimately, then, this leads to a generalization of the Lorentz transformations. (For an elaboration of all of this see [1].)

9. Fragments f1 and f2 come ('become') to share the same A-series when and only when they observe/measure/collapse the state function of—each other. No anthropocentrism at all is assumed or implied.

A further note.

10. As those versed in the philosophy of time know, there is the near-ubiquitous problem of super/meta—time. The issue is that if temporal dimension t_1 is graphed or given by a definite world-line, then it is static, so another temporal dimension, t_2 is required to 'move' things along t_1 so as to get actual change. But then if t_2 is graphed or given by a definite world-line, the same consideration applies to *it*, so we require a third temporal dimension t_3, to actually 'move' things along t_2 ... and one is thus lead to an infinite regress. One solution is to first suppose that the 'movement' is modeled by the B-series (earlier-times to later-times) of each fragment 'moving' past the (unique) A-series present of each fragment, [2], where the idea is then that

11. 'movement' (temporal becoming) is given by an operator that irreducibly *operates*, i.e. it is irreducibly a *verb*, on the variables within each fragment.

12. On a first take, at least, it looks like this operator is, in fact, *viz.* an interpretation of quantum mechanics, the projection (projecting) of a Hermitian operator (or POVM) on a state-vector in the relevant Hilbert space (one defined in fragment f1 and a corresponding one defined in fragment f2) that describes a measurement in quantum mechanics.

That's it.

C. It could be argued that part (A) above can be thought of as more of a *derivation* than a *justification* for the interpretation. It simply follows from (1) and (2), which are both on firm ground, and both of which obtain before any considerations about quantum mechanics come into the picture.

If tomorrow it were discovered that the laws of physics are radically different than what we think they are today, then the *motivation* for this interpretation would be the same (though the Hilbert space formalism would be changed). That's because the data of our sensations takes precedence over whatever we might *think about* physical objects and space and time and outcomes of 3rd-person (as opposed to 1st-person) experiments. This is in *acute* contrast to all of the other realist interpretations on the table as of this writing, 4/23/2022. The interpretation of this paper is wildly more robust than them. Moreover, this interpretation could be considered to be a *super-realist* interpretation in some sense because it uses data that takes precedence over realist 'objects' that are *presumed* to be 'out there' whose ontological status is, however, problematic in the quantum realm.

Obviously there is more that could be said, including (I claim) a neat derivation of the beginnings of what looks like the Born Rule [1]. But the main idea here was just to give the derivation (A).

[1] see the slightly mis-named “Fragmental Presentism and Quantum Mechanics” https://philpapers.org/rec/MERFPA-2 and the earlier slightly mis-named “Perspectival QM and Presentism: a New Paradigm” https://philpapers.org/rec/MERPQA

[2] “An Un-moving Spotlight Theory of Presentism” https://philpapers.org/rec/MERAUS