Review of: "Relation Between Quantum Jump and Wave Function Collapse"

Felix Buot[1]

1 University of San Carlos, Philippines

Potential competing interests: No potential competing interests to declare.

Reviewer's comments on the paper entitled: "Relation between quantum jump and wave function collapse" by Tadashi Nakajima

1. One thing not mentioned in this paper is the resolution of the measurement process. If the resolution is perfect, then it seems the quantum jump is identical to the wavefunction collapse. I believe this is a kind of selective quantum jump.
2. A case in point is the Fourier transform analyzer. A wavefunction composed of a superposition of several local functions can collapse into one of the component local wavefunctions after the analyzer. This can be considered a microscopic quantum jump because it is a unitary transformation, but the original wavefunction is no longer existing, so this can also be considered a wavefunction collapse to a "site" wavefunction from the superposition.
3. If a multichannel analyzer has a perfect energy resolution, then the number of particles in this energy is Boson distributed, or Fermi distributed depending on having different other quantum labels by virtue of the Pauli exclusion principle for fermions.
4. Another aspect not considered is the degeneracy of quantum labels. If the degeneracy is split by the action of an external field, and/or symmetry breakdown, and the quasiparticles settle at the lowest energy, then it seems this is a microscopic quantum jump.
5. In general, a Schrödinger wavefunction can be considered an average quantum field of many-body physics. So, the quadratic functions of this wavefunction define either Cooper pairing or quasiparticle Fermi or Bose distribution. Thus, an effective single-particle wavefunction can characterize distribution functions.

In summary, this paper, although very interesting and thought-provoking, I would like to see some comments on items (1) to (5) above for clarifications to help the readers.