What needs to be known about the 'Collapse' of Quantum-Mechanical 'Wave-Function'

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Abstract

Quantum mechanical wave function predicts probabilities of finding a 'particle' at different points in space, but at the time of detection a particle is detected only at one place. The question is: how this place gets decided, and can be predicted. To seek answer to this, we assume here that a 'particle' has a 'diameter' equal to its 'Compton-wavelength', and depending upon the relative velocity between this particle and observer, its Compton-wavelength experiences 'Relativistic length-contraction'. Then we Fourier-transform this 'length-contraction' in 'space-domain' into 'spectral-expansion' $\Delta\omega$ in 'frequency-domain', and find that momentum of a particle can be expressed as: $m\, v = h\, \Delta\omega / 2\, \pi\, c$, and de Broglie's wavelength, $\lambda_B = 2\, \pi\, c / \Delta\omega$; as was derived in [ref.1 and 2. In the ref-2 it was shown that: in fact it is the expansion of spectrum in the frequency-domain, which is the physical-cause for the Relativistic length-contraction]. Then we notice that the frequency-domain translation of the particle's length in space-domain has a continuous spectrum; i.e. it contains a set of frequencies ranging from ω_{max} to ω_{min} . Therefore, as we found in my previous paper [3], this wide set of waves coherently add only at discrete points in space, and mutually nullify their amplitudes at rest of the places; and the place at which all the spectral-components of the wide set of waves, contained in the expanded band $\Delta\omega$, will add constructively, will depend on the relative phase of all the spectral components. It is proposed here, that we need to know the relative phase angles of every spectral-component contained in the wide set of waves contained in the expanded band by $\Delta\omega$, for predicting the exact place of detection of the 'particle

References:

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