Wigner Scale-Space Density & UFO Technological Surprise

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The Wigner phase space density for a single-particle space for two spacetime events P, P' is the following Fourier transform of the reduced single particle quantum density matrix $\rho_1(P, P')$

$$W_1(x,p) = \frac{1}{(2\pi\hbar)^4}\int e^{ipy/\hbar}\rho_1\left(x-\frac{y}{2}, x+\frac{y}{2}\right)d^4y \tag{1.1}$$

Replace the Fourier transform kernel $e^{ipy/\hbar}$ by the wavelet-kernel

$$\psi_{s,x}(y) \equiv \frac{1}{|s|^4}\psi\left(\frac{y-x}{s}\right) \tag{1.2}$$

for scale s.

The Wigner scale-space density is then

$$W_1(x,s) = \int \psi_{s,x}(y)\rho_1\left(x-\frac{y}{2}, x+\frac{y}{2}\right)d^4y \tag{1.3}$$

Superfluid ODLRO is factorization of the first reduced density matrix into the macro-quantum phase coherent part with local order parameter $\Psi(x) = |\Psi(x)|e^{i\arg\Psi(x)}$ and residual random noise "normal fluid" fluctuations

$$\rho_1\left(x-\frac{y}{2}, x+\frac{y}{2}\right) \to \Psi^*\left(x-\frac{y}{2}\right)\Psi\left(x+\frac{y}{2}\right) + \rho_{1n}\left(x-\frac{y}{2}, x+\frac{y}{2}\right) \tag{1.4}$$

This is generally true for real both real and virtual superfluids.

In the case of my new macro-quantum vacuum physics, the spacetime coordinates are that of the center of mass of a single virtual electron-positron pair[1] in a bound state wave packet $\Psi(x)\big/\sqrt{N_{e^+e^-BEC}}$ where $N_{e^+e^-BEC}$ is the total number of virtual electron-positron

[1] The relative coordinate for the separation between the virtual electron and its twin virtual positron in the same bound state pair is integrated out in the usual way like in the BCS and Gorkov Green's function models of real superconductors.

pairs that macroscopically occupy that bound state of lower energy than the random unbound "ionized" virtual pairs of the normal fluid PV QED zero point fluctuations.[2]

The locally variable quintessent field is then

$$\Lambda(x,s) = L_p W_{1ZPF}(x,s) = L_p \left[\frac{1}{L_p^3} - W_{1e^+e^-BEC}(x,s) \right] \tag{1.5}$$

where

$$W_{1ZPF}(x,s) \equiv \sum_{i=fermions+bosons} W_{1ZPFi}(x,s) \tag{1.6}$$

ZPF means locally random "Zero Point Fluctuations" and $L_p^2 \equiv \hbar G/c^3$.

$$W_{1e^+e^-BEC}(x,s) = \int \psi_{x,s}(y) \Psi^*\left(x - \frac{y}{2} \right) \Psi\left(x + \frac{y}{2} \right) d^4 y \tag{1.7}$$

$$\tilde{\Psi}_{e^+e^-BEC}(x,s) \equiv \sqrt{\left| W_{e^+e^-BEC}(x,s) \right|} e^{i\Theta(x,s)} \tag{1.8}$$

Note that $\psi_{x,s}(y) d^4 y$ must be dimensionless -- hence my choice of the normalization factor $|s|^{-4}$ for the basic "mother wavelet" in (1.2).

Einstein's "classical"[3] geometrodynamic field is[4], with scale dependence explicit, is

$$g_{\mu\nu}(x,s) = L_p^2 \left(\frac{\partial^2 \Theta(x,s)}{\partial x^\mu \partial x^\nu} + \frac{\partial^2 \Theta(x,s)}{\partial x^\nu \partial x^\mu} \right) \tag{1.9}$$

Einstein's local field equation is generalized to

$$R_{\mu\nu}(x,s) - \frac{1}{2} R_\sigma^\sigma(x,s) g_{\mu\nu}(x,s) + \Lambda(x,s) g_{\mu\nu}(x,s) = -\frac{8\pi G}{c} T_{\mu\nu}(x,s) \tag{1.10}$$

supplemented by the covariant Landau-Ginzburg equation with covariant derivatives D_μ

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[2] Do not confuse PV zero point fermion virtual pair fluctuations with zero point virtual photon fluctuations. The latter can be viewed as advanced radiation reaction as in Dirac-Wheeler-Feynman model discussed by Hoyle and Narlikar.

[3] Really "macro-quantum", i.e., strictly speaking there is no "classical limit" in old sense of Bohr's Correspondence Principle.

[4] Neglecting gauge force field contributions now for simplicity of the essential new idea here.

$$D^{\mu}D_{\mu}\tilde{\Psi}_{e^+e^-BEC}\left(x,s\right)+\alpha\tilde{\Psi}_{e^+e^-BEC}\left(x,s\right)+\beta\left|\tilde{\Psi}_{e^+e^-BEC}\left(x,s\right)\right|^2\tilde{\Psi}_{e^+e^-BEC}\left(x,s\right)=0 \quad (1.11)$$

The usual Bianchi identities leading to

$$D^{\nu}G_{\mu\nu}\equiv D^{\nu}\left(R_{\mu\nu}-\frac{1}{2}R^{\sigma}_{\sigma}g_{\mu\nu}\right)=0 \quad (1.12)$$

are violated when the quintessent field Λ[5] is locally variable. These Bianchi identities associated with local conservation of momenergy for the external field stress energy density tensor, i.e.,

$$D^{\nu}T_{\mu\nu}=0 \quad (1.13)$$

These Bianchi identities assume two physical conditions

1. metricity, i.e. $D^{\nu}g_{\mu\nu}=0$
2. zero torsion tensor, i.e. $\Gamma^{\lambda}_{\mu\nu}=\Gamma^{\lambda}_{\nu\mu}$

Since the spacetime stiffness factor G/c^4 is so huge, and since Λ seems to[6] depend on the nonradiating electromagnetic induction near fields in a softer more manageable environmentally friendly way, we make the approximation to Einstein's generalized field equation

$$G_{\mu\nu}\left(x,s\right)+\Lambda\left(x,s\right)g_{\mu\nu}\left(x,s\right)\simeq 0 \quad (1.14)$$

This leapfrogs over the space-time stiffness barrier completely. In this limit

$$D^{\nu}G_{\mu\nu}\left(x,s\right)+\frac{\partial\Lambda\left(x,s\right)}{\partial x^{\nu}}g_{\mu\nu}\left(x,s\right)\simeq 0 \quad (1.15)$$

Equation (1.15) is the "vacuum propeller" equation for weightless warp drive.[7] Here I assume metricity. Therefore, in this case the locally variable quintessent field is, perhaps a torsion field generator.[8] That is, make the wild "half-baked" conjecture

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[5] The usual macro-quantum vacuum has zero quintessence. Positive quintessence with overpowering negative quantum pressure consequently *anti-gravitates* as exotic vacuum stuff. Therefore, this simply and elegantly explains several important, so far unexplained, phenomena: acceleration of universe; star gate time travel; and the weightless warp drive of the alleged flying saucers. The latter alleged phenomenon, if real, is a major military threat from an advanced non-terrestrial culture that the USAF has no defense against at this time. Negative quintessence with overpowering positive quantum pressure consequently gravitates, thus explaining the dark energy of the "missing mass" of the universe, which is most of the mass of the universe.

[6] Conjecture at this stage deduced from alleged flying saucer flight capability.

[7] The flying saucer generates its own timelike geodesic for the motion of its center of mass with small tidal forces and no local g-forces.

$$\frac{\partial \Lambda}{\partial x^{\mu}} \overset{?}{=} T^{\nu}_{\mu\nu} \qquad (1.16)$$

Where $T^{\lambda}_{\mu\nu}$ is the third rank torsion field tensor corresponding to dislocation gap defects in Hagen Kleinert's "World Crystal Lattice" elasticity strain model of Einstein's 1915 Geometrodynamics as in equation (1.9) above. The infinitesimal curvature loops of parallel transport of tangent vector fields fail to close.

If we keep the stress energy density tensor, we have the condition for either extracting vacuum energy for traditional power uses including impulse propulsion of the usual rocket kind, and also concealing energy storing it inside the macro-quantum vacuum for stealth cloaking of military air force and naval operations including silent running of submarines.

[8] Gennady Shipov in Moscow has been working on such a theory.