

**From:** Jack Sarfatti <sarfatti@pacbell.net>  
**Date:** Mon Jun 30, 2003 12:01:49 PM US/Pacific  
**To:** jfwoodward@juno.com  
**Subject:** Re: Bohm & Machian lambda field & string theory

On Monday, June 30, 2003, at 02:06 AM, jfwoodward@juno.com wrote:

On Sun, 29 Jun 2003 14:53:06 -0700 Jack Sarfatti <sarfatti@pacbell.net> writes:

James go to <http://www.earthtech.org/publications/index.html>

Ibison discusses tension between local ZPF and nonlocal Machian POV's

e.g. M.Ibison, "A ZPF-mediated cosmological origin of electron inertia,"

in Gravitation and Cosmology: From the

Hubble Radius to the Planck Scale, Eds. R. Amoroso, G. Hunter, M. Kafatos and J.-P. Vigié (Kluwer Academic Press, Dordrecht, the Netherlands, in press, 2001).

"Interesting (though Michael Ibison's more recent paper suggests serious problems with the HRP scheme). Actually, from my point of view at any rate, if you take Mach's principle at all seriously (and I do), then it is clear that local inertial properties and behavior must be a consequence of the gravitational action of distant matter."

Wheeler already discusses that rather completely classically in e.g. "Gravitation and Inertia" with Ciufolini.

In my theory LOCAL  $g_{\mu\nu}(x)$  is from locally differentiating (twice) the Goldstone phase field  $\arg\psi(x)$  of the PV coherence complex number LOCAL  $\psi(x)$  giant vacuum wave. However,  $\psi(x)$  obeys the local nonlinear Diff(4) covariant Landau-Ginzburg equation, which in Bohmian hydrodynamic form has a NONLOCAL MACRO-QUANTUM potential something like

$Q(x) \sim |\psi(x)|^{-1} \text{Diff}(4) \text{ Covariant Wave Operator}[\psi(x)] + \text{Nonlinear corrections}$

I have yet to work that out in detail. The first gradient<sup>2</sup>- wave dependent term is non-mechanical intensity-independent context-dependent "organic" as usual. But it seems obvious that the GLOBAL Machian influence is in the NONLOCALITY of  $Q(x)$ ?

"The universality of that interaction (that arises from an interesting invariance property of the gravitational interaction) combined with the fluctuation-dissipation theorem (à la Wheeler and Feynman, Hoyle and Narlikar, Milonni, and others) makes it tempting to try to reinterpret all of this as a local ZPF phenomenon. But the ZPF in question in this case must be the "gravinertial" ZPF, whatever that may be, dominated by "dark energy", and so on. . . . I know you have your candidate (and HRP have theirs) and, no doubt, there likely will be others as time goes by."

HRP is dead for a variety of reasons.

1. Modanese shot it down as inconsistent with QED when Bernie Haisch brought him to CIPA for a short stay.
2. Hal's PV give the wrong prediction for high energy scattering off lepto-quarks if one tries to do a micro-geometrodynamic with it. Hal's PV has the lepto-quarks growing bigger in effective size rather than smaller as one probes deeper.
3. EM virtual ZPF plays a small role in determining rest mass  $m$  of lepto-quarks. The main effect is from the  $e^+e^-$

condensate as I show explicitly because it controls the residual micro-quantum total LOCAL ZPF  $\Lambda(x)$  field via the Higgs amplitude  $|\Psi(x)|$ .

4. I already have a formula for  $m$  in the toy model. Neglecting charge and spin for simplicity

$$|\Lambda_{zpf}|^{-1/2} = h/mc$$

$m$  = renormalized rest mass of lepto-quark

The rest mass comes, in this toy model, completely from the  $\Lambda_{zpf} < 0$  exotic vacuum "dark matter core" of the zero point energy micro "geon".

Where also

$$G^*m/c^2 = h/mc$$

i.e.

$$G^*m^2/hc = 1$$

$$m = (h/c)\Lambda_{zpf}^{1/2}$$

Note  $m = 0$  when the physical vacuum limited region (support of the spatially-extended Bohm particle hidden variable) is not exotic.

$$m^{-2} = (c/h)^2\Lambda_{zpf}^{-1}$$

Note the non-perturbative "singular limit" of the effective zero point induced strong short range Sakahrov-Salam effective "dark matter" gravity coupling strength like in BCS theory's bottom up emergent order from spontaneous broken vacuum symmetry.

$$G^* = hc/m^2 = hc(c/h)^2\Lambda_{zpf}^{-1} \rightarrow \text{infinity as } \Lambda_{zpf} \rightarrow 0.$$

Note however  $G^*(\text{lepto-quarks}) \gg G(\text{Newton})$ .

The universal scale using Susskind's "world hologram" that is ALREADY Globally MACHIAN is

$$L_p^{*2} = G^*h/c^3 = L_p^4/3(c/H_0)^2/3$$

where  $H_0$  is the Hubble scale for our universe

$$c/H_0 \sim 10^{28} \text{ cm}$$

$$L_p^{*2} = hG(\text{Newton})/c^3 \sim 10^{-66} \text{ cm}^2$$

Therefore

$$L_p^* \sim 1 \text{ fermi} \sim 10^{-13} \text{ cm}$$

Therefore, the UNIVERSAL hadronic resonance "string theory" Regge trajectory slope is

$$G^*/hc \sim (1\text{Gev}/c^2)^{-1} = \text{Alpha}' \text{ of string theory where}$$

$$J \sim \text{Alpha}'m^2$$

I first suggested this main idea in 1973 when Abdus Salam invited me to ICTP. I did the work first at SDSU. It was published in Herbert Frohlich's journal "Collective Phenomena". I did not know of dark energy and dark matter back then. No one did.

"But the important point here for rapid spacetime transport is not so much what the particulars of the local ZPF may happen to be."

I have solved that. It's simply Kip Thorne's traversable wormholes and Alcubierre's free float warp drive metric engineered with the LOCAL  $\wedge zpf(x)$  field configurations of both signs positive (strong anti-gravity) and negative (strong gravity) as needed by the exotic vacuum local geometrodynamical field equation

$$G_{\mu\nu}(x) + \wedge zpf(x)g_{\mu\nu}(x) \sim 0$$

+ the desired metric form in the usual standard mainstream way.

I see no deep problems of principle here. It's now an engineering problem to control  $\wedge zpf(x)$  via the Josephson "weak link" effect.

"Rather, it is that to do really exotic stuff, what must be found is a means to "decouple" local stuff from the "gravinertial" action of distant matter notwithstanding that that may be dominated by a local ZPF out there. . . . because that stuff out there, acting gravitationally here (via a WFHN interaction), is the actual source of the local properties/behavior."

Jack earlier: You can download the pdf. There is also a recent paper on PV UFO propulsion. What do you think?

"You mean the Brighton paper? I can't say that I think there's much promise in Casimir type manipulations. The effects, even in extreme cases, are far too small."

I meant the Mitre paper. But they keep re-Haisching the same paper. I suppose it's ecological. :-) Agreed. I have already essentially showed how to do it right in

<http://qedcorp.com/APS/Ukraine.doc>

Puthoff and all those ex-NASA BPP guys, like Al Holt, Franklin Meade, Mark Millis, Sturrock, Jacques Vallee et-al in the Laurance Rockefeller UFO study group have barking up the wrong tree beating a dead horse etc. They have not changed their tune in a decade. Same old. Same old. ;-)

"I must own that I find it curious that even in the most recent HFGW meeting paper that there is no real mention of the part of the "PV" approach that bears on transport schemes: namely the third term in Eq. 3 -- the supposed vacuum energy density term."

Hey I missed that! Let me take a look see. Oh yes, you are right. They throw the baby out with the bath water there. I don't think their formula for that term is correct however because the whole theory is ill posed to begin with. However they should at least play with that term! You make a very good point here. Thanks.

"This term actually falls out of the creation of the field equation from the Lagrangian as a field (that is, LHS of the equation) term. Careful definition of some parameters leads to the d'Alembertian of the square root of K plus this term, which, of course isn't a classical wave equation. But if you arbitrarily put this on the source side (RHS) of the equation, then you're left with the d'Alembertian. Note that you can only get away with this transfer to the RHS in a gravity theory, for in any other long-range force theory, field and source quantities are distinct and can't be shuffled around this way. As an added bonus you get the source scaling trick (the multiplicative factor of  $c^4/8\pi G$ ) when

you do this. None of this is discussed up front in the papers on the PV approach; and none of them even hint at how the validity of this term may be investigated, much less how it might be put to practical advantage. . . . But perhaps in time all of this will get laid out. . . ."

Excellent, excellent, excellent remark! :-)

Here at least is how to connect what I am talking about with what they are doing. However, I bet what they are doing will not work in detail.