Infinite Orthogonal Dimensionality

Part I: Why We Need Linearity and How Does This Make the Space-Time Jitter

by
Dr. Norbert Schwarzer

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Infinite Orthogonal Dimensionality
Part I:
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2 Abstract

In this short paper we will discuss the question of universal infinity and linearity.

As a by-product, we will find "the struggle for linearity" as the source and driving force for the quantum jitter and vacuum fluctuations. This, however, can only be derived from a quantum gravity ansatz, which we are going to apply.

As there are apparently many ways to linearize quantum gravity field equations, we will present our results in a series of papers about the—here—so-called "Infinite Orthogonal Dimensionality".

3 Demanding Linearity = Principle of Superposition

3.1 Why Linearity?

One of the authors of the fundamental book [1], Dr. David Martin, always insisted on the existence of an infinite number of options, not just in this universe, but with every system. He named this principle "the principle of infinite dimensionality"[1]. As an illustrative example Dr. Martin often uses the following constellation:

"The Observer-Observed entanglement BY DEFINITION gives rise to the very definition of "incapable of being correlated or covariance" as the extinguished observation moment means that all uncorrelated options simultaneously exist including the extinction of the very observation just made. Just like you cannot take a step into the same stream twice, so to one cannot make the same observation twice. The erasure of "new" and the persistence of a "memory function" means that the observation dyad – once observed – is statically orthogonal to itself!"

Along the way, one automatically also gets a very small problem with the so-called covariance principle, but this was already discussed elsewhere [1, 2].

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[1] In order to be fair and correct, one should mention that Dr. Martin at first referred to his principle by using the expression "infinite orthogonality" or "infinite orthogonal dimensionality", but due to the fact that in the scientific community the technical expression "orthogonality" is mainly seen as dimensional linear independency and thus, with reduction to this aspect, is not of need as any linear independent set of dimensions could be orthonormalized by the Gram-Schmidt process, the principle was reduced to the current "infinite dimensionality" when just considering ideal systems. Nevertheless, orthogonality—as we will show in this paper—has its justification in Martin's principle because:

A) We can easily show mathematically that any non-orthogonality is nothing other than entanglement. This allows us to assume a fundamental orthogonality with entanglements instead of working with non-orthogonalities.

B) There is a statistical orthogonality when ALWAYS and very fundamentally conspiring the whole (see derivation (1) to (4)).

The problem some—more clever—critiques, when not resorting to ad hominem arguments right from the start, had with this concept was that a system (perhaps even this universe) may not have infinitely many attributes to actually produce the demanded infinite dimensionality. So, how can the principle still be fulfilled even in systems (space-times) with finite numbers of dimensions?

Well, at least when leaving orthogonality aside for the time being, the answer is surprisingly simple: linearity!

Linearity allows the superposition of solutions to a system, and even with just two solutions S_1 and S_2 to a system, one might always construct a superposition like:

$$S_{tot} = a \cdot S_1 + b \cdot S_2 \tag{1}$$

and one ends up with an infinite number of possibilities when a and b are arbitrary… not being orthogonal to each other, though.

And how does the statistic orthogonality come into play? Which is to say, how is it assured that nobody goes twice through the same river, or what assures that every linear combination occurs only once? Well, in order to put it mathematically, we just have to extend (1) to its true and practical form, which reads:

$$S_{tot} = a \cdot S_1 + b \cdot S_2 + c \cdot S_{Universe} . \tag{2}$$

Of course, $S_{Universe}$ actually means $S_{Rest\_of\_the\_universe}$, because the states S_1, S_2 are a part of the universe. Each and every practical linear combination of states S_1, S_2 exists in this universe, which in the moment the linear combination is formed, shall exist in state $S_{Universe\_A}$. Resolving the linear combination and reforming it some point in time later would not only change the universe due to the process itself, but it also happens at a different state $S_{Universe\_B}$ even when the states S_1, S_2 and their formation would—for some funny reason—not influence the rest of the world. Hence, (2)—when realized for the first time—would have to be written:

$$S_{tot} = a \cdot S_1 + b \cdot S_2 + c \cdot S_{Universe\_A} , \tag{3}$$

while its second realization leads to:

$$S_{tot} = a \cdot S_1 + b \cdot S_2 + c \cdot S_{Universe\_B} . \tag{4}$$

As the two situations statistically and fundamentally exclude each other, one has an orthogonality, and the fact that there are infinitely many such combinations leads to our “orthogonal infinity” or “infinite orthogonality” principle.

4 Bringing in Time

When substituting the $S_{universe}$-term by time t:

$$S_{tot} = a \cdot S_1 + b \cdot S_2 + t , \tag{5}$$

we might even conclude that in fact the principle of infinite orthogonality holds true even for systems without the universal rest as long as these systems have time, because we would then obtain two otherwise equal states as two different moments in time, which is to say:

$$S_{tot} = a \cdot S_1 + b \cdot S_2 + t_A , \tag{6}$$

$$S_{tot} = a \cdot S_1 + b \cdot S_2 + t_B . \tag{7}$$

On the other hand, we may just take time as what it has been used here in our equations, namely a dimension summing up “the universal rest”:

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$$c \cdot S_{\text{Universe}} = t\,, \tag{8}$$

thereby making every constellation unique.

5 Quantization

The question which still needs to be discussed and answered in connection with our principle of the infinite orthogonality is the one about the character of the parameters in the state-equations (2) to (7). Are these parameters 100% continuous or are they somehow restricted, perhaps even quantized?

The answer to this question can only be given via a true Quantum Gravity Theory.

Hence, we are in need of such a theory and it is quite a lucky coincident that we also possess it (see appendix).

6 The Problem of Nonlinearity in Quantum Gravity Theories

There is one other problem, however, and this has to do with the fact that the equations arising from the fundamental Hamilton principle—even in its adjusted and generalized form—are apparently nonlinear and—consequently—would not allow for the superposition of solutions.

But is this truly so?

We will see that there is in fact a huge variety of options to find linear quantum field equations without approximations. The important aspect thereby: It apparently have to be quantum gravity equations. Just the classical gravity equations will not do.

We will see this in the next section when rigidly demanding linearity just with the classical Einstein field equations [3, 4].

7 Metric Linearity

When trying to directly construct linear differential equations from the Einstein-Hilbert action, one has to start with the main component of the Einstein field equations, which is the Ricci tensor and the Ricci scalar. The first can be given in terms of the metric tensor and its derivatives as follows:

$$R_{\alpha\beta} = \begin{pmatrix} -\frac{1}{2}\left(g_{\alpha\beta,ab} + g_{ab,\alpha\beta} - g_{\alpha b,a\beta} - g_{\beta b,a\alpha}\right) g^{ab} \\ +\frac{1}{2}\left(\frac{1}{2} g_{ac,\alpha} \cdot g_{bd,\beta} + g_{\alpha c,a} \cdot g_{\beta d,b} - g_{\alpha c,a} \cdot g_{\beta b,d}\right) g^{ab} g^{cd} \\ -\frac{1}{4}\left(g_{\alpha c,\beta} + g_{\beta c,\alpha} - g_{\alpha\beta,c}\right)\left(2 g_{bd,a} - g_{ab,d}\right) g^{ab} g^{cd} \end{pmatrix}. \tag{9}$$

The latter, the Ricci scalar, then results from the first via:

$$R_{\alpha\beta} g^{\alpha\beta} = \begin{pmatrix} -\frac{1}{2}\left(g_{\alpha\beta,ab} + g_{ab,\alpha\beta} - g_{\alpha b,a\beta} - g_{\beta b,a\alpha}\right) g^{ab} \\ +\frac{1}{2}\left(\frac{1}{2} g_{ac,\alpha} \cdot g_{bd,\beta} + g_{\alpha c,a} \cdot g_{\beta d,b} - g_{\alpha c,a} \cdot g_{\beta b,d}\right) g^{ab} g^{cd} \\ -\frac{1}{4}\left(g_{\alpha c,\beta} + g_{\beta c,\alpha} - g_{\alpha\beta,c}\right)\left(2 g_{bd,a} - g_{ab,d}\right) g^{ab} g^{cd} \end{pmatrix} g^{\alpha\beta}. \tag{10}$$

The demand of linearity leads to:

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$$\begin{pmatrix} \frac{1}{2} g_{ac,\alpha} \cdot g_{bd,\beta} + g_{\alpha c,a} \cdot g_{\beta d,b} - g_{\alpha c,a} \cdot g_{\beta b,d} \\ -\frac{1}{2}\left(g_{\alpha c,\beta} + g_{\beta c,\alpha} - g_{\alpha\beta,c}\right)\left(2g_{bd,a} - g_{ab,d}\right) \end{pmatrix} g^{ab} g^{cd} = 0, \tag{11}$$

respectively, (significantly less restrictive):

$$\begin{pmatrix} \frac{1}{2} g_{ac,\alpha} \cdot g_{bd,\beta} + g_{\alpha c,a} \cdot g_{\beta d,b} - g_{\alpha c,a} \cdot g_{\beta b,d} \\ -\frac{1}{2}\left(g_{\alpha c,\beta} + g_{\beta c,\alpha} - g_{\alpha\beta,c}\right)\left(2g_{bd,a} - g_{ab,d}\right) \end{pmatrix} g^{ab} g^{cd} g^{\alpha\beta} = 0. \tag{12}$$

Using the adapted Einstein field equations following from the non-extremal Hamilton principle (see appendix of this paper):

$$\delta W = 0 = \delta \int_V d^n x \cdot \sqrt{-g} \cdot L \quad \Rightarrow \quad \delta W = ? = \delta \int_V d^n x \cdot \sqrt{-g} \cdot L, \tag{13}$$

we result in:

$$\begin{aligned} 0 &= \int_V d^n x \sqrt{-g} \left(R_{\kappa\lambda} \delta g^{\kappa\lambda} - R \cdot \left(\frac{1}{2} + H \right) g_{\kappa\lambda} \delta g^{\kappa\lambda} \right) \\ &= \int_V d^n x \sqrt{-g} \left(R_{\kappa\lambda} - R \cdot \left(\frac{1}{2} + H \right) g_{\kappa\lambda} \right) \delta g^{\kappa\lambda} \quad , \\ &\Rightarrow R_{\kappa\lambda} - R \cdot \left(\frac{1}{2} + H \right) g_{\kappa\lambda} = 0 \end{aligned} \tag{14}$$

and demand the following:

$$R_{\mu\nu} - R \cdot \left(\frac{1}{2} + H \right) g_{\mu\nu} = 0$$

$$\Rightarrow$$

$$\begin{pmatrix} \begin{pmatrix} -\frac{1}{2}\left(g_{\mu\nu,ab} + g_{ab,\mu\nu} - g_{\mu b,a\nu} - g_{\nu b,a\mu}\right) g^{ab} \\ +\frac{1}{2}\left(\frac{1}{2} g_{ac,\mu} \cdot g_{bd,\nu} + g_{\mu c,a} \cdot g_{\nu d,b} - g_{\mu c,a} \cdot g_{\nu b,d}\right) g^{ab} g^{cd} \\ -\frac{1}{4}\left(g_{\mu c,\nu} + g_{\nu c,\mu} - g_{\mu\nu,c}\right)\left(2g_{bd,a} - g_{ab,d}\right) g^{ab} g^{cd} \end{pmatrix} \\ -\left(\frac{1}{2} + H\right) g_{\mu\nu} \begin{pmatrix} -\frac{1}{2}\left(g_{\alpha\beta,ab} + g_{ab,\alpha\beta} - g_{\alpha b,a\beta} - g_{\beta b,a\alpha}\right) g^{ab} \\ +\frac{1}{2}\left(\frac{1}{2} g_{ac,\alpha} \cdot g_{bd,\beta} + g_{\alpha c,a} \cdot g_{\beta d,b} - g_{\alpha c,a} \cdot g_{\beta b,d}\right) g^{ab} g^{cd} \\ -\frac{1}{4}\left(g_{\alpha c,\beta} + g_{\beta c,\alpha} - g_{\alpha\beta,c}\right)\left(2g_{bd,a} - g_{ab,d}\right) g^{ab} g^{cd} \end{pmatrix} g^{\alpha\beta} \end{pmatrix} = 0 \quad . \tag{15}$$

There, we find the linearity condition to be:

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$$\left(\begin{array}{l} \left(\begin{array}{l}\frac{1}{2}\left(\frac{1}{2} g_{ac,\mu}\cdot g_{bd,\nu}+g_{\mu c,a}\cdot g_{\nu d,b}-g_{\mu c,a}\cdot g_{\nu b,d}\right)g^{ab}g^{cd}\\ -\frac{1}{4}\left(g_{\mu c,\nu}+g_{\nu c,\mu}-g_{\mu\nu,c}\right)\left(2g_{bd,a}-g_{ab,d}\right)g^{ab}g^{cd}\end{array}\right)\\ -\left(\frac{1}{2}+H\right)g_{\mu\nu}\left(\begin{array}{l} \frac{1}{2}\left(\frac{1}{2} g_{ac,\alpha}\cdot g_{bd,\beta}+g_{\alpha c,a}\cdot g_{\beta d,b}-g_{\alpha c,a}\cdot g_{\beta b,d}\right)g^{ab}g^{cd}\\ -\frac{1}{4}\left(g_{\alpha c,\beta}+g_{\beta c,\alpha}-g_{\alpha\beta,c}\right)\left(2g_{bd,a}-g_{ab,d}\right)g^{ab}g^{cd}\end{array}\right)g^{\alpha\beta}\end{array}\right)=0. \qquad (16)$$

Whatever metric components are being fixed this way, the remaining terms read:

$$\begin{array}{c} R_{\mu\nu}-R\cdot\left(\frac{1}{2}+H\right)g_{\mu\nu}=0\\ \Rightarrow\\ \left(\begin{array}{l} \left(-\frac{1}{2}\left(g_{\mu\nu,ab}+g_{ab,\mu\nu}-g_{\mu b,a\nu}-g_{\nu b,a\mu}\right)g^{ab}\right)\\ -\left(\frac{1}{2}+H\right)g_{\mu\nu}\left(-\frac{1}{2}\left(g_{\alpha\beta,ab}+g_{ab,\alpha\beta}-g_{\alpha b,a\beta}-g_{\beta b,a\alpha}\right)g^{ab}\right)g^{\alpha\beta}\end{array}\right)=0\end{array}. \qquad (17)$$

This, however, are no linear differential equations and thus, their solutions are non-additive. We see that we are back with the condition (11), giving us a Ricci-curvature-free space-time due to:

$$0=\left(g_{\alpha\beta,ab}+g_{ab,\alpha\beta}-g_{\alpha b,a\beta}-g_{\beta b,a\alpha}\right)g^{ab} \qquad (18)$$

and the linear field equation:

$$g_{\alpha\beta,ab}+g_{ab,\alpha\beta}-g_{\alpha b,a\beta}-g_{\beta b,a\alpha}=0. \qquad (19)$$

One may conclude at this point that the cosmological observation of space being apparently flat on bigger scales is just a result of the superposition principle, because without linearity such superposition, meaning the coexistence of solutions and subsequent "infinite dimensionality", would not be possible.

8 Hamilton Linearity and the Jitter of Space-Time

Another way to enforce linearity and subsequent super-positivity would be the adjustment of the Hamilton principle (also see the appendix of this paper). Thereby we do not demand the variation of the action to give any particular result, like zero as in the classical case (13), but always try to assure linearity for the field equations… or at least parts of these, as we will consider in the next parts of this series of publications.

Let us denote the nonlinear parts of the Ricci tensor and the Ricci scalar as follows:

$$NL_{\alpha\beta}=\left(\begin{array}{l}\frac{1}{2} g_{ac,\alpha}\cdot g_{bd,\beta}+g_{\alpha c,a}\cdot g_{\beta d,b}-g_{\alpha c,a}\cdot g_{\beta b,d}\\ -\frac{1}{2}\left(g_{\alpha c,\beta}+g_{\beta c,\alpha}-g_{\alpha\beta,c}\right)\left(2g_{bd,a}-g_{ab,d}\right)\end{array}\right)g^{ab}g^{cd}, \qquad (20)$$

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$$\mathrm{NL}=\mathrm{NL}_{\alpha\beta}g^{\alpha\beta}=\begin{pmatrix}\frac{1}{2}g_{ac,\alpha}\cdot g_{bd,\beta}+g_{\alpha c,a}\cdot g_{\beta d,b}-g_{\alpha c,a}\cdot g_{\beta b,d}\\-\frac{1}{2}\left(g_{\alpha c,\beta}+g_{\beta c,\alpha}-g_{\alpha\beta,c}\right)\left(2g_{bd,a}-g_{ab,d}\right)\end{pmatrix}g^{ab}g^{cd}g^{\alpha\beta}, \tag{21}$$

then a linearity-demanding Hamilton principle could be satisfied via:

$$\begin{gathered}?\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}\right)\delta g^{\alpha\beta}\\ \Rightarrow\\ \int_V d^n x\sqrt{-g}\times T\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}\right)\delta g^{\alpha\beta}\\ \int_V d^n x\sqrt{-g}\times\delta g^{\alpha\beta}\cdot(?)_{\alpha\beta}\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}\right)\delta g^{\alpha\beta}\\ \int_V d^n x\sqrt{-g}\times\delta g^{\alpha\beta}\cdot\left(\mathrm{NL}_{\alpha\beta}-\mathrm{NL}_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}\right)\delta g^{\alpha\beta}\\ \Rightarrow 0\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}-\left(\mathrm{NL}_{\alpha\beta}-\mathrm{NL}_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)\right)\delta g^{\alpha\beta}\end{gathered}. \tag{22}$$

In the classical theory the additional term $\left(\mathrm{NL}_{\alpha\beta}-\mathrm{NL}_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)$ under the integral in the last line of (22) would simply be interpreted as matter, but as we have already seen in our previous publications [5, 6, 7, 8], we might just transform even this matter away. Following the procedure in [8], we assume that there exists another metric $\gamma_{\alpha\beta}$, which allows us to rewrite the last line in (22) as follows:

$$\begin{aligned}&\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}-\left(\mathrm{NL}_{\alpha\beta}-\mathrm{NL}_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)\right)\delta g^{\alpha\beta}\\&=\sqrt{-\gamma}\cdot F^{\frac{n}{2}}\cdot\left(R^{*}{}_{\alpha\beta}-\frac{g_{\alpha\beta}}{2}R^{*}\right)\delta\left(\frac{\gamma^{\alpha\beta}}{F}\right)\end{aligned}. \tag{23}$$

The term for the scale adapted Ricci scalar was already given above and now—as being for the metric tensor $\gamma_{\alpha\beta}$—reads:

$$R^{*}=\frac{R}{F}-\frac{1}{2F^2}\begin{pmatrix}(n-1)\left(\overbrace{2\gamma^{ab}F_{,ab}+F_{,d}\gamma^{cd}\gamma^{ab}\gamma_{ab,c}}^{=2\Delta_\gamma F-2F_{,d}\gamma^{cd}{}_{,c}}\right)\\-nF_{,d}\gamma^{cd}\gamma^{ab}\gamma_{ac,b}\end{pmatrix}-(n-1)\frac{\gamma^{ab}F_{,a}\cdot F_{,b}}{4F^3}(n-6)\cdot \tag{24}$$

Now, when incorporating (23) into (22), we obtain:

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$$\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}-\left(NL_{\alpha\beta}-NL_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)\right)\delta g^{\alpha\beta}$$
$$=\sqrt{-\gamma}\cdot F^{\frac{n}{2}}\cdot\left(R^{*}{}_{\alpha\beta}-\frac{g_{\alpha\beta}}{2}R^{*}\right)\delta\left(\frac{\gamma^{\alpha\beta}}{F}\right)$$
$$\Rightarrow$$
$$0\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}-\left(NL_{\alpha\beta}-NL_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)\right)\delta g^{\alpha\beta} \quad . \tag{25}$$
$$=\int_V d^n x\sqrt{-\gamma}\cdot F^{\frac{n}{2}}\cdot\left(R^{*}{}_{\alpha\beta}-\frac{g_{\alpha\beta}}{2}R^{*}\right)\delta\left(\frac{\gamma^{\alpha\beta}}{F}\right)=\int_V d^n x\sqrt{-\gamma\cdot F^{n}}\cdot\left(R^{*}{}_{\alpha\beta}-\frac{g_{\alpha\beta}}{2}R^{*}\right)\delta G^{\alpha\beta}$$
$$=\int_V d^n x\sqrt{-G}\cdot\left(R^{*}{}_{\alpha\beta}-\frac{g_{\alpha\beta}}{2}R^{*}\right)\delta G^{\alpha\beta}=\delta_{G^{\alpha\beta}}\int_V d^n x\sqrt{-G}\cdot R^{*}$$

This variation, however, just gives us the classically known result from [4] for the vacuum case, namely:

$$\delta_{G_{\alpha\beta}}W=\delta_{G_{\alpha\beta}}\int_V d^n x\left(\sqrt{-G}\cdot R^{*}\right)=\int_V d^n x\left(\sqrt{-G}\cdot\left(R^{*}{}_{\alpha\beta}-\frac{R^{*}}{2}G_{\alpha\beta}\right)\right). \tag{26}$$

In other words: A universe, keen on placing its existence on David's principle of infinite dimensionality and subsequent additivity, would always insist on substituting a set of field equations of the type (26) by its linear variational equivalent (22), which is to say:

$$0\simeq\int_V d^n x\sqrt{-g}\times\left(R_{\alpha\beta}-\frac{R}{2}g_{\alpha\beta}-\left(NL_{\alpha\beta}-NL_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}\right)\right)\delta g^{\alpha\beta}\,. \tag{27}$$

Such a universe, however, can have no true vacuum. The term assuring its linearity and thus, David's principle, namely:

$$T_{\alpha\beta}=NL_{\alpha\beta}-NL_{\mu\nu}g^{\mu\nu}\cdot\frac{g_{\alpha\beta}}{2}, \tag{28}$$

would always provide a permanent vacuum fluctuation… being—apparently—but the eternal struggle for the satisfaction of the linearity condition or—as we named it here—David's principle. The observer would realize this linearization as virtual matter and energy field.

Most interestingly, all modern Quantum Theories demand the existence of vacuum fluctuations and experimental observations like the Casimir effect prove their presence. Here we have now derived their fundamental metric origin. Apparently, it is not the zero in Hamilton's postulation which is fundamental, but the "infinite dimensionality" and linearity condition, hence, David's principle.

9 Conclusions

"The Observer-Observed entanglement BY DEFINITION gives rise to the very definition of "incapable of being correlated or covariance" as the extinguished observation moment means that all uncorrelated options simultaneously exist including the extinction of the very observation just made. Just like you cannot take a step into the same stream twice, so to one cannot make the same observation twice. The erasure of "new" and the persistence of a "memory function" means that the observation dyad – once observed – is statically orthogonal to itself!" (Dr. David Martin)

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10 References

[1] W. Wismann, D. Martin, N. Schwarzer, "Creation, Separation, and the Mind – the Three Towers of Singularity: The Application of Universal Code in Reality", 2024, RASA® strategy book, ISBN: 9798218444839

[2] N. Schwarzer, "The Covariance Principle is Dead, Long Live the Covariance Principle - How Quantum Gravity Kills a Cornerstone of Physics", self-published, Amazon Digital Services, 2023, Kindle, ASIN: B0C96L41LS

[3] A. Einstein, "Grundlage der allgemeinen Relativitätstheorie", 1916, Annalen der Physik (ser. 4), 49, pp. 769–822

[4] D. Hilbert, "Die Grundlagen der Physik, Teil 1", Göttinger Nachrichten, 1915, pp. 395–407

[5] N. Schwarzer, "Fluid Universe – The Way of Structured Water: Mathematical Foundation", 2025, a Jenny Stanford Pub. mathematical foundations book project

[6] N. Schwarzer, "Supra Fluid Universe – The Way of Coherent Domains: Solving a few Problems", 2025, a SIO science book, www.siomec.de

[7] N. Schwarzer, "The Principle of the Ever-Jittering Fulcrum and the 3-Generations Problem of Elementary Particles", 2025, a SIO science paper, www.siomec.de

[8] N. Schwarzer, "The Origin of Matter AND Something About the Missing f(R)-Theories in This Universe", 2025, a SIO science paper, www.siomec.de

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11 Appendix

From Wikipedia, the free encyclopedia (https://en.wikipedia.org/wiki/Hamilton's_principle):

> *In physics, Hamilton's principle is William Rowan Hamilton's formulation of the principle of stationary action. It states that the dynamics of a physical system are determined by a variational problem for a functional based on a single function, the Lagrangian, which may contain all physical information concerning the system and the forces acting on it. The variational problem is equivalent to and allows for the derivation of the differential equations of motion of the physical system. Although formulated originally for classical mechanics, Hamilton's principle also applies to classical fields such as the electromagnetic and gravitational fields, and plays an important role in quantum mechanics, quantum field theory and criticality theories.*

So, the definition of the Hamilton principle is based on its "formulation of the principle of stationary action". In simpler words, the variation of such an action should be zero or, mathematically formulated, should be put as follows:

$$\delta W = 0 = \delta \int_V d^n x \cdot \sqrt{-g} \cdot L . \tag{29}$$

Here L stands for the Lagrangian, W the action, and g gives the determinant of the metric tensor, which describes the system in question within an arbitrary Riemann space-time with the coordinates x. Thereby, we used the Hilbert formulation of the Hamilton principle [1] in a slightly more general form. We were able to show in [2] that the original Hilbert variation does not only produce the Einstein field equations [3] but also contains the Quantum Theory [2, 4, 5]. It should be noted that, while the original Hilbert paper [1] started with the Ricci scalar R as the integral kernel, which is to say L=R, we here used a general Langrangian, because—as we will show later in this appendix—this generality—in principle—is already contained inside the original Hilbert formulation. Even, as strange as it may sound at this point, general kernels with functions of the Ricci scalar f(R) [6] are already included (see [14]) in the Hilbert approach.

But what if we lived in a universe where the only thing that was certain was uncertainty?

One of the authors of [7], Dr. David Martin, always used the analogy of a moving fulcrum to demonstrate his uneasiness with the formulation (13) [13].

In [7] we were able to show that the Hamilton principle itself hinders us to localize any system or object at a certain position. We also see that this contradicts the concept of particles. Everything seems to be permanently on the move or—rather—ever-jittering.

But if this ever-jittering fulcrum was one of the fundamental properties of our universe, should we then not take this into account when formulating the laws of this very universe? Shouldn't we better write (13) as follows:

$$\delta W \to 0 \cong \delta \int_V d^n x \cdot \sqrt{-g} \cdot L \, ? \tag{30}$$

And while we are at it, should we not start to investigate an even more general principle like:

$$\delta W \to f\left(W, x, g_{\alpha\beta}\right) = \delta \int_V d^n x \cdot \sqrt{-g} \cdot L \, ? \tag{31}$$

The interesting aspect about this is that this investigation was already—partially—done by (surprise, surprise) e.g., Hilbert and Einstein. But instead of explaining it in this way, they have "hidden" their generalization inside other concepts like the introduction of a cosmological constant or—oh yes—the postulation of matter and its introduction via an ominous and purely postulated parameter L_M, which is to say, a Lagrange matter term.

11.1 The Classical Hamilton Extremal Principle and How to Obtain Einstein's General Theory of Relativity with Matter (!) and Quantum Theory… Also with Matter (!)

The famous German mathematician David Hilbert [1], even though applying his technique only to derive the Einstein field equations for the General Theory of Relativity [3] in four dimensions,—in principle—extended the classical Hamilton principle to an arbitrary Riemann space-time with a very general variation by not only—as Hamilton and others had done—concentrating on the evolution of the given problem or system in time, but with respect to all its dimensions. His formulation of the Hamilton extremal principle looked as follows:

$$\delta W = 0 = \delta \int_V d^n x \left(\sqrt{-g} \cdot \left(R - 2\Lambda + L_M \right) \right). \tag{32}$$

There we have the Ricci scalar of curvature R, the cosmological constant Λ, the Lagrange density of matter L_M, and the determinant g of the metric tensor of the Riemann space-time $g_{\alpha\beta}$. For historical reasons, it should be mentioned that Hilbert's original work [1] did not contain the cosmological constant because it was added later by Einstein in order to obtain a static universe, but this is not of any importance here. The evaluation of the so-called Einstein-Hilbert action (32) brought indeed the Einstein General Theory of Relativity [3], but it did not produce the other great theory physicists have found, which is the Quantum Theory. It was not before the author of this article here, about one hundred years after the publication of Hilbert's paper [1], extended Hilbert's approach by considering scaling factors to the metric tensor and showed that Quantum Theory already resides inside the sufficiently general General Theory of Relativity [2, 4, 7, 8, 9, 10]. We will not discuss the reason why this simple idea has not been tried out by other scientists before, but we may still express our amazement about the fact that a simple extension of the type:

$$G_{\alpha\beta} = g_{\alpha\beta} \cdot F[f] \tag{33}$$

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solves one of the greatest problems in science[2], namely the unification of physics and that it took science more than 100 years to come up with the idea. Using the symbol G for the determinant of the scaled metric tensor $G_{\alpha\beta}$ from (33) of the Riemann space-time, we can rewrite the Einstein-Hilbert action from (32) as follows:

$$\delta W = 0 = \delta\int\limits_V d^n x\left(\sqrt{-G}\cdot\left(R^{*}-2\Lambda+L_M\right)\right). \tag{34}$$

Just as a side-note, we want to point out that also variational structures as:

$$\delta W = 0 = \delta\int\limits_V d^n x\left(\sqrt{-G}\cdot F^{q}\cdot\left(R^{*}-2\Lambda+L_M\right)\right) \tag{35}$$

could be possible and still converge to the classical form for F→1. Here, which is to say in this paper, we will only consider examples with q=0, but for completeness and later investigation we shall mention that a comprehensive consideration of variational integrals for the cases of general q are to be found in [4].

Performing the variation in (34) with respect to the metric $G_{\alpha\beta}$ and remembering that the Ricci curvature of such a metric (e.g., [7] appendix D) changes the whole variation to:

$$\begin{aligned}\delta W = 0 &= \delta\int\limits_V d^n x\left(\sqrt{-G}\cdot F^{q}\cdot\left(R^{*}-2\Lambda+L_M\right)\right)\\ &= \delta\int\limits_V d^n x\left(\sqrt{-G}\cdot F^{q}\cdot\left(\left(\begin{array}{c}\dfrac{R}{F}-\dfrac{1}{2F^2}\left(\begin{array}{l}(n-1)\left(\overbrace{2g^{ab}F_{,ab}+F_{,d}g^{cd}g^{ab}g_{ab,c}}^{=2\Delta F-2F_{,d}g^{cd}{}_{,c}}\right)\\ -nF_{,d}g^{cd}g^{ab}g_{ac,b}\end{array}\right)\\ -(n-1)\dfrac{g^{ab}F_{,a}\cdot F_{,b}}{4F^3}(n-6)\end{array}\right)-2\Lambda+L_M\right)\right),\end{aligned} \tag{36}$$

results in:

$$\begin{aligned}0 &= \left(R^{*}{}_{\alpha\beta}-\frac{1}{2}R^{*}\cdot G_{\alpha\beta}\right)\overbrace{\left(\frac{1}{F}\cdot\delta g^{\alpha\beta}+g^{\alpha\beta}\cdot\delta\left(\frac{1}{F}\right)\right)}^{\delta G^{\alpha\beta}}\\ &= \left(\begin{array}{c}\left(\begin{array}{c}R_{\alpha\beta}-\dfrac{1}{2F}\left(\begin{array}{c}F_{,\alpha\beta}(n-2)+F_{,ab}g_{\alpha\beta}g^{ab}+F_{,a}g^{ab}\left(g_{\beta b,\alpha}-g_{\beta\alpha,b}\right)-\\ F_{,\alpha}g^{ab}g_{\beta b,a}-F_{,\beta}g^{ab}g_{\alpha b,a}+F_{,d}g^{cd}\left(\begin{array}{c}g_{\alpha c,\beta}-\dfrac{1}{2}ng_{\alpha c,\beta}-\dfrac{1}{2}ng_{\beta c,\alpha}\\ +\dfrac{1}{2}ng_{\alpha\beta,c}+\dfrac{1}{2}g_{\alpha\beta}g_{ab,c}g^{ab}\end{array}\right)\end{array}\right)\\ +\dfrac{1}{4F^2}\left(F_{,\alpha}\cdot F_{,\beta}(3n-6)+g_{\alpha\beta}F_{,c}F_{,d}g^{cd}(4-n)\right)\end{array}\right)\\ +\left(\dfrac{(n-1)}{2F}\left(\begin{array}{c}\left(\overbrace{2g^{ab}F_{,ab}+F_{,d}g^{cd}g^{ab}g_{ab,c}}^{=2\Delta F-2F_{,d}g^{cd}{}_{,c}}\right)\\ -\dfrac{n}{(n-1)}F_{,d}g^{cd}g^{ab}g_{ac,b}\end{array}\right)+\dfrac{g^{ab}F_{,a}\cdot F_{,b}}{4F^2}(n-6)-\dfrac{R}{(n-1)}\right)\cdot\dfrac{g_{\alpha\beta}}{2}\end{array}\right)\delta G^{\alpha\beta},\end{aligned} \tag{37}$$

[2] This does not mean, of course, that we should not also look out for generalizations of the scaled metric and investigate those as we did in [10].

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when setting q=0 and assuming a vanishing cosmological constant. With a cosmological constant we have to write:

$$
\begin{aligned}
0 &= \left(R^{*}{}_{\alpha\beta} - \frac{1}{2}R^{*}\cdot G_{\alpha\beta}\right)\overbrace{\left(\frac{1}{F}\cdot\delta g^{\alpha\beta} + g^{\alpha\beta}\cdot\delta\left(\frac{1}{F}\right)\right)}^{\delta G^{\alpha\beta}} \\
&= \left(\begin{array}{c}
\boxed{\boxed{R_{\alpha\beta} - R\frac{g_{\alpha\beta}}{2}}} + \boxed{\Lambda\cdot g_{\alpha\beta}} \\
-\frac{1}{2F}\left(\begin{array}{c}
F_{,\alpha\beta}(n-2) + F_{,ab}g_{\alpha\beta}g^{ab} + F_{,a}g^{ab}\left(g_{\beta b,\alpha} - g_{\beta\alpha,b}\right) - \\
F_{,\alpha}g^{ab}g_{\beta b,a} - F_{,\beta}g^{ab}g_{\alpha b,a} + F_{,d}g^{cd}\left(\begin{array}{c}
g_{\alpha c,\beta} - \frac{1}{2}ng_{\alpha c,\beta} - \frac{1}{2}ng_{\beta c,\alpha} \\
+\frac{1}{2}ng_{\alpha\beta,c} + \frac{1}{2}g_{\alpha\beta}g_{ab,c}g^{ab}
\end{array}\right)
\end{array}\right) \\
+\frac{1}{4F^{2}}\left(F_{,\alpha}\cdot F_{,\beta}(3n-6) + g_{\alpha\beta}F_{,c}F_{,d}g^{cd}(4-n)\right) \\
+\left(\frac{(n-1)}{2F}\left(\begin{array}{c}
2\Delta F - 2F_{,d}g^{cd}{}_{,c} \\
-\frac{n}{(n-1)}F_{,d}g^{cd}g^{ab}g_{ac,b}
\end{array}\right) + \frac{g^{ab}F_{,a}\cdot F_{,b}}{4F^{2}}(n-6)\right)\cdot\frac{g_{\alpha\beta}}{2}
\end{array}\right)\delta G^{\alpha\beta} \quad . \qquad (38)
\end{aligned}
$$

For better recognition of the classical terms, we have reordered a bit and boxed the classical vacuum part of the Einstein field equations (double lines) and the cosmological constant term (single line). Everything else can be—no, represents (!)—matter or quantum effects or both.

Thus, we also—quite boldly—have set the matter density L_M equal to zero, because we see that already our simple metric scaling brings in quite some options for the construction of matter. It will be shown elsewhere [10] that there is much more which is based on the same technique.

11.2 Principle of the Ever-Jittering Fulcrum and the Alternate Hamilton Principle

We might bring forward two reasons why we could doubt the fundamentality of the Hamilton principle even in its most general form of the generalized Einstein-Hilbert action:

a) The principle was postulated and never fundamentally derived.
b) Even the formulation of this principle in its classical form (32) results in a variety of options where factors, constants, kernel adaptations, etc. could be added, so that the rigid setting of the integral to zero offers some doubt in itself. A calculation process which offers a variety of add-ons and options should not contain such a dogma. The result should be kept open and general. Dr. David Martin proposed this as the “tragedy of the jittering fulcrum” and we therefore named this principle “David’s principle of the ever-jittering fulcrum”. It demands:

$$
\begin{aligned}
\delta_{g_{\alpha\beta}}W &\simeq ? \simeq \delta_{g_{\alpha\beta}}\int_V d^n x\sqrt{-g}\times R \\
\delta_{G_{\alpha\beta}}W &\simeq ? \simeq \delta_{G_{\alpha\beta}}\int_V d^n x\sqrt{-G}\times R^{*} \quad .
\end{aligned} \qquad (39)
$$

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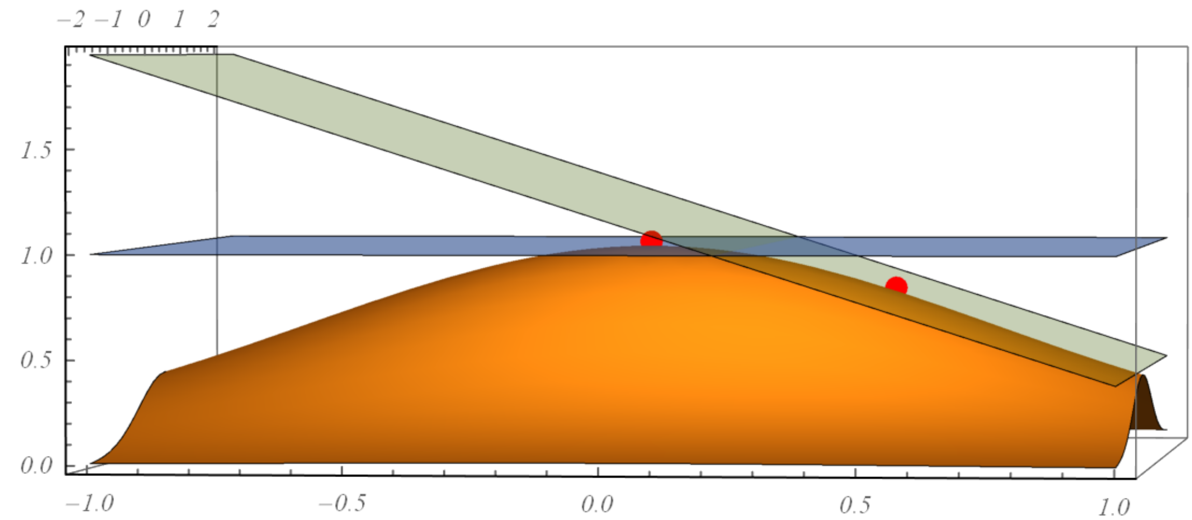

Fig. A1: David's principle of the ever-jittering fulcrum cannot accept a dogmatic insistence on a zero outcome of the Einstein-Hilbert action (32) or (generalized and also bringing about the Quantum Theory) (34). Instead it should allow for all states and not just the extremal position (see the two red dots and the corresponding tangent planes in the picture).

One of the simplest generalizations of the classical principle could be the linear one, which is illustrated in figure A1. It could be constructed as follows:

$$\int_V d^n x \sqrt{-g} \times \xcancel{h}^{\alpha\beta} \cdot g_{\alpha\beta} = \delta_{g_{\alpha\beta}} W = \delta_{g_{\alpha\beta}} \int_V d^n x \sqrt{-g} \times R \,. \tag{40}$$

Thereby we have used the classical form with the unscaled metric tensor, respectively without setting the factor apart from the rest of the metric. Performing of the variation on the right-hand side and setting

$$\xcancel{h}^{\alpha\beta} = H \cdot \delta g^{\alpha\beta} \tag{41}$$

or—for the reason of—maximum generality even:

$$\xcancel{h}^{\alpha\beta} = H^{\alpha\beta}_{ab} \cdot \delta\gamma^{ab} = H \cdot \delta g^{\alpha\beta} \tag{42}$$

just gives us the same result as we would obtain it when assuming a non-zero cosmological constant, because evaluation yields:

$$\begin{aligned} \int_V d^n x \sqrt{-g} \times H \cdot \delta g^{\alpha\beta} \cdot g_{\alpha\beta} &= \int_V d^n x \sqrt{-g} \times \left(R_{\alpha\beta} - \frac{R}{2} g_{\alpha\beta} \right) \delta g^{\alpha\beta} \\ \Rightarrow 0 &= \int_V d^n x \sqrt{-g} \times \left(R_{\alpha\beta} - \frac{R}{2} g_{\alpha\beta} - H g_{\alpha\beta} \right) \delta g^{\alpha\beta} \end{aligned} , \tag{43}$$

respectively:

$$\begin{aligned} \int_V d^n x \sqrt{-g} \times H^{\alpha\beta}_{ab} \cdot \delta\gamma^{ab} \cdot g_{\alpha\beta} &= \int_V d^n x \sqrt{-g} \times \left(R_{\alpha\beta} - \frac{R}{2} g_{\alpha\beta} \right) \delta g^{\alpha\beta} \\ \Rightarrow 0 &= \int_V d^n x \sqrt{-g} \times \left(R_{\alpha\beta} - \frac{R}{2} g_{\alpha\beta} - H g_{\alpha\beta} \right) \delta g^{\alpha\beta} \end{aligned} . \tag{44}$$

Simply setting $H=-\Lambda$ (c.f. single-line boxed term in equation (38)) demonstrates this.

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Nothing else is the usage of a general functional term T, being considered a function of the coordinates of the system (perhaps even the metric tensor) in a general manner, as follows:

$$\int_V d^n x \sqrt{-g} \times T = \delta_{g_{\alpha\beta}} W = \delta_{g_{\alpha\beta}} \int_V d^n x \sqrt{-g} \times R \,. \tag{45}$$

As before, performing of the variation on the right-hand side and setting

$$T = T_{\alpha\beta} \cdot \delta g^{\alpha\beta} \tag{46}$$

gives us something which was classically postulated under the variational integral, namely the classical energy-matter tensor. This time, however, it simply pops up as a result of David's principle of the jittering fulcrum and is equivalent to the introduction of the term L_M under the variational integral. Evaluation yields:

$$\begin{aligned} \int_V d^n x \sqrt{-g} \cdot T_{\alpha\beta} \cdot \delta g^{\alpha\beta} &= \int_V d^n x \sqrt{-g} \times \left(R_{\alpha\beta} - \frac{R}{2} g_{\alpha\beta} \right) \delta g^{\alpha\beta} \\ \Rightarrow 0 &= \int_V d^n x \sqrt{-g} \times \left(R_{\alpha\beta} - \frac{R}{2} g_{\alpha\beta} - T_{\alpha\beta} \right) \delta g^{\alpha\beta} \end{aligned} \,. \tag{47}$$

So, we see that in introducing a cosmological constant and in postulating a matter term, even Einstein and Hilbert already—in principle—"experimented" with a non-extremal setting for the Hamilton extremal principle.

Apart from linear dependencies and other functions or functional terms, we could just assume a general outcome like:

$$f(W) = f\left(\int_V d^n x \sqrt{-g} \times R \right) = \delta_{g_{\alpha\beta}} W = \delta_{g_{\alpha\beta}} \int_V d^n x \sqrt{-g} \times R \,\cdot \tag{48}$$

This, however, would not give us any substantial hint where to move on, respectively, which of the many possible paths to follow. We therefore here start our investigation with the assumption of an eigen result for the variation as follows:

$$\not\lambda \cdot W = \not\lambda \cdot \int_V d^n x \sqrt{-g} \times R = \delta_{g_{\alpha\beta}} W = \delta_{g_{\alpha\beta}} \int_V d^n x \sqrt{-g} \times R \,. \tag{49}$$

This leads to:

$$\int_V d^n x \sqrt{-g} \left(R_{\kappa\lambda} \delta g^{\kappa\lambda} - R \cdot \left(\frac{1}{2} \cdot g_{\kappa\lambda} \delta g^{\kappa\lambda} + \not\lambda \right) \right) = 0 \,. \tag{50}$$

As the term $\not\lambda$ could always be expanded into an expression like:

$$\not\lambda = H \cdot g_{\kappa\lambda} \delta g^{\kappa\lambda} \,, \tag{51}$$

we obtain from (50):

$$\begin{aligned} 0 &= \int_V d^n x \sqrt{-g} \left(R_{\kappa\lambda} \delta g^{\kappa\lambda} - R \cdot \left(\frac{1}{2} + H \right) g_{\kappa\lambda} \delta g^{\kappa\lambda} \right) \\ &= \int_V d^n x \sqrt{-g} \left(R_{\kappa\lambda} - R \cdot \left(\frac{1}{2} + H \right) g_{\kappa\lambda} \right) \delta g^{\kappa\lambda} \\ &\Rightarrow R_{\kappa\lambda} - R \cdot \left(\frac{1}{2} + H \right) g_{\kappa\lambda} = 0 \end{aligned} \,. \tag{52}$$

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We realize that the term *H* can be a general scalar even if we would demand the term $\not{H}$ to be a constant.

The complete equation when assuming a scaled metric tensor of the form (33) would read:

$$\left(\begin{aligned}&\left(\begin{aligned}&R_{\alpha\beta}-\frac{1}{2F}\left(\begin{aligned}&F_{,\alpha\beta}(n-2)+F_{,ab}g_{\alpha\beta}g^{ab}\\&+F_{,a}g^{ab}\left(g_{\beta b,\alpha}-g_{\beta\alpha,b}\right)-F_{,\alpha}g^{ab}g_{\beta b,a}-F_{,\beta}g^{ab}g_{\alpha b,a}\\&+F_{,d}g^{cd}\left(g_{\alpha c,\beta}-\frac{1}{2}ng_{\alpha c,\beta}-\frac{1}{2}ng_{\beta c,\alpha}+\frac{1}{2}ng_{\alpha\beta,c}+\frac{1}{2}g_{\alpha\beta}g_{ab,c}g^{ab}\right)\end{aligned}\right)\\&\qquad+\frac{1}{4F^2}\left(F_{,\alpha}\cdot F_{,\beta}(3n-6)+g_{\alpha\beta}F_{,c}F_{,d}g^{cd}(4-n)\right)\end{aligned}\right)\\&-\left(\begin{aligned}&R-\frac{1}{2F}\left((n-1)\left(\overbrace{2g^{ab}F_{,ab}+F_{,d}g^{cd}g^{ab}g_{ab,c}}^{=2\Delta F-2F_{,d}g^{cd}{}_{,c}}\right)-nF_{,d}g^{cd}g^{ab}g_{ac,b}\right)\\&\qquad-(n-1)\frac{g^{ab}F_{,a}\cdot F_{,b}}{4F^2}(n-6)\end{aligned}\right)\cdot\left(\frac{1}{2}+H\right)g_{\alpha\beta}\end{aligned}\right)=0, \tag{53}$$

and in the case of metrics with constant components this equation simplifies to:

$$\left(\begin{aligned}&\left(\begin{aligned}&R_{\alpha\beta}-\frac{1}{2F}\left(F_{,\alpha\beta}(n-2)+F_{,ab}g_{\alpha\beta}g^{ab}\right)\\&+\frac{1}{4F^2}\left(F_{,\alpha}\cdot F_{,\beta}(3n-6)+g_{\alpha\beta}F_{,c}F_{,d}g^{cd}(4-n)\right)\end{aligned}\right)\\&-\left(R-\frac{(n-1)}{2F}\left(2g^{ab}F_{,ab}+\frac{g^{ab}F_{,a}\cdot F_{,b}}{2F}(n-6)\right)\right)\cdot\left(\frac{1}{2}+H\right)g_{\alpha\beta}\end{aligned}\right)=0\cdot \tag{54}$$

11.2.1The Question of Stability

From purely mechanical considerations, one might assume that extremal solutions of the variational equation (39) correspond to more stable states than non-extremal solutions, and in fact we will find this in connection with the 3-generations problem, which we have discussed in [12].

The interested reader finds further discussion in our publication [11].

11.3 Appendix References

[1] D. Hilbert, “Die Grundlagen der Physik, Teil 1”, Göttinger Nachrichten, 1915, pp. 395–407

[2] N. Schwarzer, “The World Formula: A Late Recognition of David Hilbert’s Stroke of Genius”, Jenny Stanford Publishing, 2020, ISBN: 9789814877206

[3] A. Einstein, “Grundlage der allgemeinen Relativitätstheorie”, 1916, Annalen der Physik (ser. 4), 49, pp. 769–822

[4] N. Schwarzer, “The Math of Body, Soul, and the Universe”, Jenny Stanford Publishing, 2022, ISBN: 9789814968249

[5] N. Schwarzer, “The Theory of Everything – Quantum and Relativity is everywhere – A Fermat Universe”, Pan Stanford Publishing, 2020, ISBN: 9814774472

[6] C. A. Sporea, “Notes on f(R) Theories of Gravity”, 2014, arxiv.org/pdf/1403.3852.pdf

[7] W. Wismann, D. Martin, N. Schwarzer, “Creation, Separation, and the Mind – the Three Towers of Singularity: The Application of Universal Code in Reality”, 2024, RASA® strategy book, ISBN: 9798218444839

For Friends Only

[8] N. Schwarzer, "The Quantum Gravity War – How will the Nearby Unification of Physics Change Future Warfare?", Jenny Stanford Publishing, 2024, ISBN: 9789814968584

[9] N. Schwarzer, "Mathematical Psychology – The World of Thoughts as a Quantum Space-Time with a Gravitational Core", Jenny Stanford Publishing, 2024, ISBN: 9789815129274

[10] N. Schwarzer, "Fluid Universe – The Way of Structured Water: Mathematical Foundation", 2025, a Jenny Stanford Pub. mathematical foundations book project

[11] N. Schwarzer, "Supra Fluid Universe – The Way of Coherent Domains: Solving a few Problems", 2025, a SIO science book, www.siomec.de

[12] N. Schwarzer, "The Principle of the Ever-Jittering Fulcrum and the 3-Generations Problem of Elementary Particles", 2025, a SIO science paper, www.siomec.de

[13] N. Schwarzer, "Why we need a generalization of the Hamilton extremal principle", 2025, a SIO science paper, www.siomec.de

[14] N. Schwarzer, "The Origin of Matter AND Something About the Missing f(R)-Theories in This Universe", 2025, a SIO science paper, www.siomec.de

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