JOURNAL OF EXCHANGES WITH PHYSICAL REVIEW D

Jean-Pierre.Petit@manaty.net

2020 setember 14 to october 24

PRD contact : **Dr Robert Wimmer**.

Adress of Physical Review D : prd@aps.org

Reference of the article : DW12414

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2020 september 14 : We send the 10 pages paper to PRD, entitled

Cosmology with negative masses. Comparison of the S.Hossenfelder model with observational data.

(French and Belgium) authors : Petit J.P, D'Agostini G., Debergh N.

2020 september 16. The manuscript DW12414 is being processed by PRD

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18 septembre 2020. Your first rejection :

Dear Dr. Jean-Pierre,

We have examined your manuscript and conclude that it is not suited for Physical Review D. We make no judgment on the correctness of the work, only on its suitability according to our other criteria.

To be publishable in Physical Review D, manuscripts must contain significant new results in physics, be of high quality and scientific interest, and be recognized as an important contribution to the literature.

We do not believe that your paper meets these criteria and feel that it will be more productive for you to seek publication in another, more specialized journal.

Yours sincerely,

Robert Wimmer
Associate Editor
Physical Review D

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18 septembre. Our first protest :

Copy to S.Hossenfeler

Sir,

This article is based on a completely new cosmological model, of the highest level in cosmology and differential geometry, published in your journal in 2008 by S.Hossenfelder under the title : A bimetric Theory with Exchange Symmetry. Phys. Rev. D78, 044015, 2008 and arXiv : 0807.2838v1 (gr-qc)17 july 2008

At a time when many articles are being published that are totally speculative, free of any observation, the results are important and undeniable. By comparing what emerges from this theory explains :

- The acceleration of cosmic expansion, with excellent agreement with observational data from 700 type Ia supernovae

- The large-scale structure of the universe where a regular distribution of negative, repulsive mass, gives the positive mass, the only visible one, a lacunar structure, agreement with the observations.

- The confinement of galaxies, including the explanation of the flatness of their velocity curves.

- The strong gravitational lens effects, due to negative gravitational lensing .

- Accounts for local relativistic effects

- Gives the first explanation of the recently discovered phenomenon, which in 2017 was given the name "Great Repeller", by identifying it as a negative mass conglomerate, invisible because it emits negative energy photons. A structure for which no credible theoretical interpretation has yet been proposed.

- Provides an alternative interpretation to the low magnitude of redshift objects greater than 7.

- Proposes observations that may give the size of the negative mass conglomerate.

- Proposes a different scheme of galaxies' formation, the compression of the positive mass, sandwiched between two negative mass conglomerates, leading to its heating, followed by a rapid radiative cooling, optimal for a plate structure.

- Finally, it is the first model that imputes the observational effects so far attributed to a mysterious dark matter and a no less mysterious dark energy by showing that the negative mass content of the universe fully accounts for all these effects. A content that is a copy of the classical particles and antiparticles, owing a negative mass and energy.

We ask that our article be reconsidered more seriously.

2020 September 24 : Your second rejection

Dear Dr. Jean-Pierre,

We have considered your remarks and do not find them to be sufficiently persuasive to warrant further consideration of your manuscript. We therefore regret to inform you that we stand by our decision against publication of your paper.

Let me mention that the only check and comparison with data caried out in the manuscript is the Hubble diagram of Fig. 2. For state of the art cosmology this is the absolute minimum and it is completely

insufficient for the level of today's precision cosmology.

Yours sincerely,

Robert Wimmer
Associate Editor
Physical Review D

2020 September 24. Our second protest :

Dear Editor,

In the field of astrophysics and cosmology, all scientific work is aimed at building a coherent and convincing interpretation of observational data. It then has two parts:

1 - The production of a coherent theoretical model

2 - The production of agreements with observational data

The mainstream model ΛCMD cannot be considered totally convincing insofar as : - All attempts to highlight various and varied models of dark matter have so far been failures - There is currently no theoretical model of dark energy that has any credibility. It is therefore perfectly licit to present an alternative interpretation of the phenomena.

In the article it is proposed that these phenomena are attributable to the presence in the universe of negative mass, this existence being presented through a coherent model that frees itself from the runaway phenomenon, in other words that satisfies the principle of action-reaction, a model that has already been the subject of a previous presentation, in your own journal (PRD Hossenfelder 2008).

Since your criticism does not refer to point 1, we assume that the purely theoretical aspects of our article appeared acceptable to you, especially since they had been published in your own journal.

You say that there is only one confirmation with observational data, concerning the acceleration of cosmic expansion, and this is shown in Figure 2. This is inaccurate.

Point number 1:

In figure 1 of the article it is mentioned the recently discovered phenomenon (Nature 2017), through a very large scale mapping of the universe, to which the name Great Repeller has been given. To date, there is no credible interpretation : If this is considered as a gap in the hypothetical positive-mass dark matter. Indeed, since

gravitational instability produces conglomerates of matter and not voids, one does not see what could have given rise to such a structure. The model presented explains the lacunar structure of the universe on a large scale, by proposing that the negative, self-attractive and denser mass (which fits in passing with the theme of cosmic acceleration, under the effect of the dominant pressure of negative mass, alias "dark energy") first forms a regular set of conglomerates which, pushing back the positive mass, confines it in the remaining space by giving it this lacunar structure. The model proposes that the Great Repeller phenomenon betrays the presence of one of these conglomerates of negative mass, which cannot be detected optically since the negative masses that constitute it emit photons of negative energy. The existence of this speed field evoking repulsion is the only data we currently have, and the model accounts for it, which seems to have escaped you.

Point number 2:

Another aspect concerns the negative gravitational lens effect, affecting the light emitted by very distant objects, which has already been described in the article you published in 2008. Such an effect could have reduced the apparent magnitude of distant sources. This is exactly what we observe with galaxies whose redshift is greater than 7. By the way it is also suggested that more precise observations in the Great Repeller region could help to determine the diameter of this object. As already presented and developed in other papers by other authors, also cited (2017 Farnes, Astronomy and Astrophysics), the flatness of the rotation curves of galaxies militates for the fact that their confinement is ensured by a negative, repulsive mass environment.

Point number 3:

These gaps in negative mass, created this time by the presence of galaxies in their centers, behave towards the gravitational lens phenomenon as attractive objects. The model thus brings a consistent interpretation to the amplitude of the gravitational lens effects in the vicinity of galaxies and clusters of galaxies, a phenomenon until now considered as being due to a halo of dark matter.

Point number 4 :

Masses of opposite signs are mutually exclusive, thus the negative mass density is practically zero in the vicinity of the solar system so that the model is then reduced to the Einstein equation, and agrees with the local relativistic observational data.

This second rejection of our paper (which has nothing to to with quantum field theory, string theory, monopoles, black holes, particle physics, etc ..) is unjustified.

We ask that it be submitted to a referee, a true expert both in differential geometry and observational cosmology and astrophysics, i.e. a person really able to judge its content.

We suggest :

S.Hossenfelder : hossi@fias.uni-frankfurt.de
C.Corda : cordac.galilei@gmail.com
T.Damour : damour@ihes.fr

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28 septembre 2020. Your third rejection :

Cher Dr. Petit,

The decision to not send this paper out for review is correct. To elaborate on this briefly:

1. The authors wish to provide an alternative to the dark matter hypothesis in order to explain one particular interesting cosmic structure (the "Great Repeller"). Their paper describes very briefly one motivation for dark matter (gravitational lensing measurements), not mentioning any of the others (including, but not limited to, the kinematics of galaxy rotation curves, the binding of galaxy clusters, the ratio of acoustic peaks in the cosmic microwave background). In addition, they do not discuss in any detail whether the dark matter hypothesis is actually deficient in explaining this structure. An alternative hypothesis needs to be motivated by a presentation of shortcomings of the standard hypothesis; this paper does not do this.

2. The alternative that the authors provide, negative mass, is a rather extraordinary one. No evidence is provided that our universe contains bodies of negative mass. A well-known aphorism has it that "extraordinary claims demand extraordinary evidence"; none is provided here.

3. The writing is very unclear and hard to follow. I grant it appears that the authors are not native English speakers, so I would be willing to cut some leeway here. However, in this case, the presentation is so confusing that I simply cannot parse large sections of the manuscript. For example, the text around the discussion of Hossenfelder's work is so confused that I cannot tell if the authors are criticizing that work or building off it (or both).

To summarize, this is a confusing and hard-to-read manuscript that uses a poorly motivated model to provide an alternative explanation to a phenomenon, without explaining why such an alternative is necessary or desirable. It does not present significant new results in physics; it is not of high quality, nor of broad scientific interest; and it would not be an important contribution to the literature.

2020 october the 8. Our third protest accompanied by a version of the article extended from 10 to 45 pages, to take into account the criticisms you have made :

Dear Editor,

We have redrafted our article to take into account the arguments on the basis of which you refused to submit it to a referee. In order to respond to your justified criticism, we had to add 26 pages where S. Hossenfelder's work is analyzed and where we have clearly stated our position with regard to his work. In addition, we have added other

observational confirmations of our model, which we had omitted in our previous mailing, thinking that it would make the article too long.

Before rejecting this new drafting of our article as being too long, we recall that the journal PRD has published two articles ([19] , [20]) devoted to this bimetric approach, by Damour, Kogan and Damour, Kogan and Papazoglou, respectively 42 and 56 pages long.

A total of 98 pages that have not led to any tangible results, nor to any model likely to be confronted with observations.

For many years PRD has published hundreds of articles on

- String theory
- Cosmic strings
- Mini black holes
- Hawking radiative dissipation of black holes
- Firewall
- Black holes thermodynamics
- Monopoles
- Inflatons
- Supersymmetry
- Massive gravity
- Neutralino
- Photino
- Gravitino
- Tachyon field
- Dark energy
- Quintessence
- K-essence
- Chaplyguin gaz
- Axions
- etc.

None of these articles led to a confrontation with observational data.

About our paper the Editorial Board is perfectly right when we writes, we quote:

> 2- The alternative that the authors provide, negative mass, is a rather extraordinary one. No evidence is provided that our universe contains bodies of negative mass. A well-known aphorism has it that “extraordinary claims demand extraordinary evidence”; none is provided here.

Following this request we have included in the article all the elements that bring credit to this model.

In point 3 the Editorial board writes:

> 3 - The writing is very unclear and hard to follow. I grant it appears that the authors are not native English speakers, so I would be willing to cut some

> leeway here. However, in this case, the presentation is so confusing that I simply cannot parse large sections of the manuscript. For example, the text around the discussion of Hossenfelder's work is so confused that I cannot tell if the authors are criticizing that work or building off it (or both).

The Editorial board is right again. These clarifications, for an article that is difficult to read, were necessary. We have therefore devoted twenty-six pages to :

- Produce a detailed analysis of S.Hossenfelder's article

- While emphasizing the mathematical rigor of this approach pointing out the failures of its application to a physical problem.

- To show how the modification of the model leads to results in agreement with the observations.

At the end of the article, we have indicated the points for which the model will have to provide its own answers, which will be provided in the following article.

We ask that this article be submitted to a competent referee:

- In differential geometry

- With respect to observational data from cosmology and astrophysics

- In topology

- In group theory and especially dynamic groups

- In Astrophysics and Dynamics of Galaxies

- In gas kinetic theory

- In Quantum Mechanics

From our references :

[19] Damour T. , Kogan I I. Effective Lagrangians and universality classes of nonlinear bigravity Phys. Rev. D **66** (2002) 104024. hep-th/0206042.

[20] Damour T. , Kogan I. I. , Papazoglou A. Non-linear bigravity and cosmic acceleration Phys. Rev. D **66** (2002) 104025. hep-th/0206044.

2020 october the 8. Your fourth rejection :

Dear Dr. Jean-Pierre,

We have considered your remarks responding to the comments of the Editorial Board Member and do not find them to be sufficiently persuasive to warrant any further consideration of your manuscript. We therefore regret to inform you that we stand by our decision against publication of your paper.

If you still wish to pursue publication of your manuscript, you will have to submit it elsewhere.

Yours sincerely,

2020 October 13. Our fourth protest :

Too good to be true.

Dear Editor

We understand your reaction.

Magazines like yours receive hundreds of articles daily from all over the world. Among them are writings by retirees who furnish their leisure time, by strangers, who sometimes do not even belong to recognized university courses, and who present you with models that, by some miracle, claim to provide outsider solutions to problems that the best specialists have not been able to provide answers to.

Before deciding to send these articles to experts, who are not paid to do this work, filterers are tasked, who quickly evaluate the articles that flood in every day. They then ask themselves these questions:

- Who are these people? Are they recognized by the scientific community in this specialty?

- Do they belong to research groups from prestigious universities?

- Has the country to which they belong been distinguished by important work in this field?

- Does the proposed article fit into the main stream?

When the author(s) claim(s) to supplant Einstein by departing completely from the main stream (dark matter, ΛCDM model), to propose something other than General Relativity, the probability that the in-depth reading of an article of several dozen pages represents a waste of time for the expert approached approaches unity.

In the case of our article there are still some previous publications in journals such as Nuovo Cimento, Astrophysics and Space Science, Modern Physics Letters A. But perhaps the experts of these journals did not see the flaw in this edifice.

The article itself seems logical, well constructed. But it all seems decidedly too good to be true :

Certainly, there are observational agreements that seem attractive. There is a beautiful curve that goes well through the points resulting from the observations. There is a beautiful image of a barred galaxy, obtained by simulation, whereas the best specalists in the world do not. There is a scientific construction based on a little-known mathematic field, dynamic groups, which claims to give an identity to the invisible components of the universe, solving the paradox of the non-observation of primordial antimatter.

So many results! At a time when theorists consider themselves happy when they identify possible leads.

We agree with you. The probability that the article we sent you is solid is a priori one in a thousand.

The difficulty of our approach was due to one point:

- If one tries to be concise, it becomes incomprehensible.

- If we try to be understandable, then what needs to be presented makes the article explode, and we are not read.

Please make an exception. Submit it to a referee. If this paper has flaws, or a fundamental flaw, that doesn't appear immediately, he will find it quickly.

J.P.Petit D. D'Agostini N. Debergh

2020 october 14. Your immediate answer :

Dear Dr. Petit,

After you rebutted our decision not to send out your manuscript for external review we consulted an Editorial Board Member, which is already a rare step we take and in that sense the exception you are asking for. The Editorial Board Member not only confirmed our decision **but also provided a detailed report** on why your paper should not be published by Phys.Rev.D.

Your response to the report of our Editorial Board Member did not change the situation and we decided against the solicitation of another report. You are indeed correct in that we have to handle our limited review resources with great responsability.

As we mentioned previously, if you still wish to pursue publication of your manuscript, you will have to submit it elsewhere.

This concludes consideration of this manuscript.

Yours sincerely,

Robert Wimmer
Associate Editor
Physical Review D

2020 October the 15. We take note of this final refusal, based on a detailed report. We request communication of this report :

manuscript DW12414

Dear Editor,

I took note that your refusal to submit our article to a referee was definitive and I will therefore not insist, despite a new drafting, extending the article to 47 pages, including 26 pages devoted to clarifying our position with respect to the work of S. Hossenfeder, which we had published in PRD in 2008 and the addition of numerous observational confirmations of the model, as well as a determination of the precise identity of the invisible components of the universe, that is to say of primordial antimatter of negative mass.

You tell me, and I thank you for this, that you made an exception and consulted the member of the editorial board who was in charge of evaluating the article about this new drafting and you tell me that :

" ...he not only confirmed this rejection decision, but also provided a detailed report on why your paper should not be published by Phys.Rev.D."

You will understand that it would be very useful for us to become aware of the flaws in our article, in view of subsequent steps towards other journals. Could you please send us a copy?

In advance, thank you

Dr. Petit

2020 October 16. Your immediate answer :

Re: DW12414

Dear Dr. Petit,

The report of the Editorial Board Member was sent to you on September 28, and you replied to it. There was no other report or communication from the Board.

Yours sincerely,

Robert Wimmer
Associate Editor
Physical Review D

This September 28th report refers to the first version of the article, which is ten pages long. On October 9, we had sent a version with an additional 35 pages, providing answers to your criticisms, but obviously you have not read this document. In the hope that it is read, we are trying to submit it to PRD, modifying its content and title:

Bimetric models. When negative mass replaces both dark matter and dark energy. Excellent agreement with observational data. Solving the problem of the primeval antimatter.

Le papier est enregistré sous la nouvelle référence : **DX12580**

2020 October 16.
46 minutes after the recording of this third version you write :

Dear Dr. Petit,

Your manuscript has been considered. **We regret to inform you that we have concluded that it is not suitable for publication in the Physical Review.**

No further communication on this manuscript, **or the identical manuscript DW1241**4 will be considered.

Yours sincerely,

Robert Wimmer Associate Editor Physical Review D

2020 october 24. We ask a simple question :

Dear Dr. Wimmer

After reading your final rejection message mentioning the detailed report on which you based your decision not to have our article reviewed by a referee we have asked you for a copy.

To our great surprise, this report of September 28 refers to the initial version of the 10-page article that had been sent to your journal.

On October 9 we had sent you a version with an additional 35 pages, representing the responses to the criticisms you had made in your September 28 report. Twenty-six pages had been devoted to explain our position with regard to the work of S. Hossenfleder, showing that if its mathematical basis was correct, only a reinterpretation based on physics could lead to confrontations with the observational data.

As you said in that report of September 28th :

“Extraordinary claims demand extraordinary evidence”; none is provided here

In this new formulation the article :

1 We have shown that the introduction of negative masses in the cosmological model was only possible by switching to a bimetric system corresponding to a system of two coupled field equations. This was the only way to escape the runaway effect and to restore the principles of equivalence and action-reaction. As a physical extension of a previous work of S.Hossenfelder, mathematically coherent (PRD 2008), we have constructed such a system.

2 Newtonian approximation shows that the interaction pattern is then:

Masses of the same signs attract each other according to Newton's law

The masses of opposite signs repel each other according to "anti-Newton"

3 The negative masses, of negative energy, emitting photons of negative energy, which our instruments cannot capture, explained why some contents of the universe escaped observation.

4 Using the theory of dynamic groups we have shown that within this second matter, of negative energy, the matter-antimatter symmetry was also present in this negative world. It has been shown that this one was simply composed of the same elements with negative masses and negative energies.

5 Taking up the ideas formulated in 1967 by Andrei Sakharov, according to which the synthesis of antimatter from antiquarks would have been faster than the synthesis of matter from quarks, in this second population, we concluded that these invisible elements did not correspond to a dark matter of positive mass, but to antimatter of negative mass : antiprotons, antineutrons, anti-electrons, embedded in negative energy photons and remaining negative energy quarks, which solves the paradox of the non-observation of promordial antimatter

6 We then constructed an exact solution, based on the hypothesis (which will be justified in a later article) of the femininity of negative masses. This solution gives a very good agreement with the data from 700 type Ia supernovae. The acceleration of the cosmic expansion is thus explained, without using the cosmological constant Λ .

7 Since negative mass has negative energy, it takes the place of this unidentified dark energy. It is not vacuum energy and simply corresponds to a contribution of quantum states of negative energy.

8 We have shown that these negative energy states emerge naturally from Dirac's equation. An approach that opens up major perspectives in Quantum Mechanics.

9 Considering that the negative mass content is negligible in the vicinity of the Sun, the conclusion is that the model agrees with local relativistic observations: advance of Mercury's perihelion, deviation of the light rays by the mass of the Sun.

10 Still according to the hypothesis of the dominance of the negative mass content, we have shown that the latter is the first to form a set of spheroidal conglomerates which, by pushing matter back into interstitial space, give it a lacunar structure.

11 This pattern of large-scale structure formation suggests a new pattern of galaxy formation. The positive mass, compressed into plates and thus heated, can rapidly dissipate this energy in the form of radiation and thus present a configuration favorable to the birth of galaxies.

12 We have suggested that the recently discovered Great Repeller (2017) could betray the presence of a negative mass conglomerate.

13 Such objects would cause a reduction in the magnitude of the objects in the background. We suggest that this is the true reason for the low magnitude of galaxies at z >7.

14 We say that future progress in the measurement of distant objects would allow, by locally highlighting a significant contrast in magnitude, to determine the diameter of such a conglomerate.

15 We speculate that these conglomerates, composed of anti-hydrogen and anti-helium of negative mass, would behave like immense protostars with a cooling time greater than the age of the universe. Thus, these objects would not be able to accommodate fusion phenomena and therefore could not produce stars, atoms heavier than these light elements and planets.

16 Life would be absent in such negative world.

17 On a smaller scale, the negative gravitational lens effect due to a negative mass environment, trapping and confining galaxies, explains the importance of the measured effects.

18 Same thing to explain the high agitation velocities of galaxies in clusters, exceeding that calculated on the lower visible mass: the confining negative mass environment is again responsible for this situation.

19 This configuration also explains the flatness of the rotation curves in galaxies.

20 We provide a model of a spheroidal galaxy, built on the basis of two Vlasov equations coupled by the Poisson equation. This elliptical solution has a radial vertex.

21 Using this model as a support for numerical simulations, it was possible to model the birth of a barred spiral galaxy, lasting for thirty turns.

22 This explains why the simulations carried out by other authors had led to the fast dissipation of the spiral arms, artificially introduced as a part of initial conditions. These structures represent the way in which a dissipative process takes place in these non-collisional systems, reflecting an exchange of energy and momentum through density waves present in the two systems. If there is no second system with which to interact, the spiral waves disappear.

In addition it was said at the end of the article that the description of the radiative age and the explanation of the establishment of this strong asymmetry would be present in a future article

Finally, Mr. Wimmer, one simple question:

- Have you read this article?

J.P.Petit, G.D'Agostini (France) , N.Debergh (Belgium).

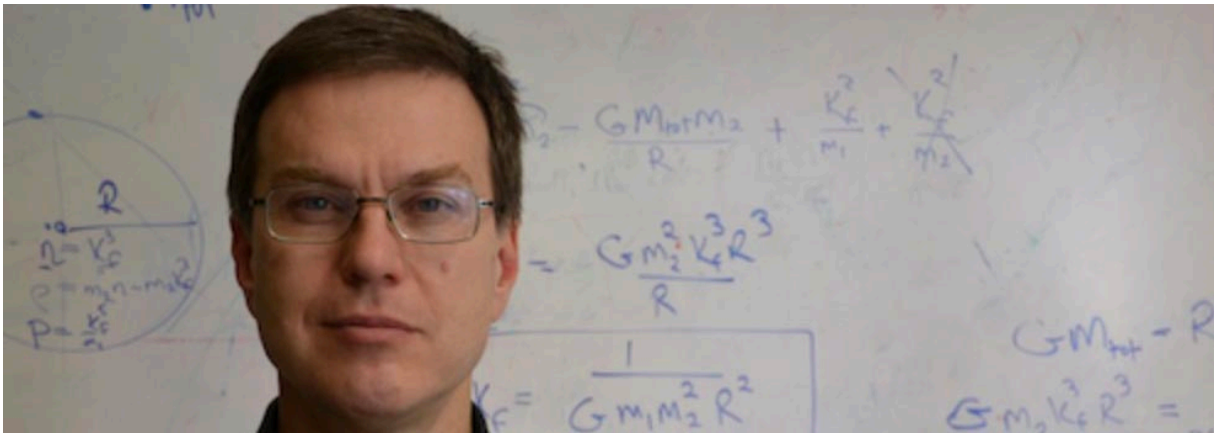
Answer of Dr. Wimmer :

No answer …

2020 Octobre 24 14 h 22

First reaction of a member of the Editorial Board :

James M. Cline jcline@physics.mcgill.ca



- *This paper is garbage.*

His works :

Quintessence, **cosmological** horizons, and self-tuning

Codimension-two branes in six-dimensional supergravity and the **cosmological** constant problem

Moduli stabilization in brane gas **cosmology** with superpotentials

Overproduction of **cosmic** superstrings

Braneworld **cosmology**
