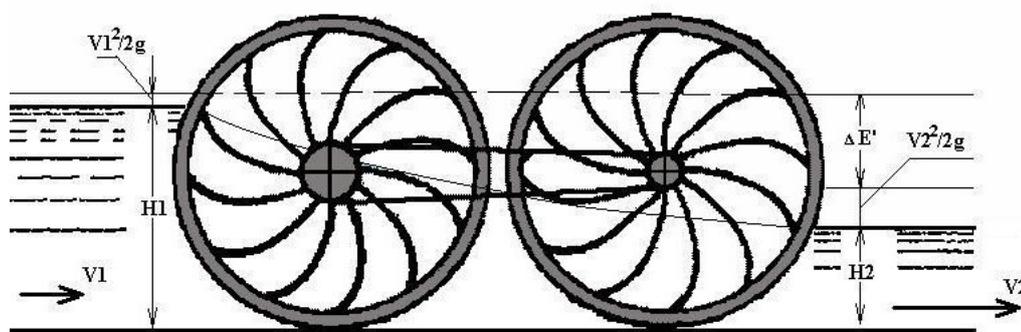


Igor Sokolov <http://aoss.engin.umich.edu/people/igorsok> had unexpectedly appeared in my life in the fall of 2013, when he rushed to defend a pseudoscientist from my criticism. This person lives in Uzbekistan, his name is Herman Treshchalov. He calls himself as Ph.D. while having no scientific degree:

Nearly 8 years Treshchalov has been aggressively touting his invention <http://erg.ucoz.org/>, which is essentially another version of a perpetual motion machine. He even introduced the term of "hydraulic Treshchalov's effect" to create the appearance of physical depth of this trivial, illiterate and even not new invention. The idea is the following.



A water stream with the speed  $\vec{u}_1$  actuates to rotate the left wheel. It rotates the right wheel the frequency of which is higher due to a step-up gear, as seen in the figure. The right wheel

accelerates the flow of water up to the speed  $\vec{u}_2$ , so its level is reduced from the initial value  $\vec{H}_1$  to the final one  $\vec{H}_2$ . Thus, according to the author, there arises a difference in water levels ( $H_1 > H_2$ ). Treshchalov believes that in this way one can release the potential energy of water, which is greater than the kinetic energy used for that. This is the so-called "Treshchalov's effect". The excess of potential energy, according to the inventor, can be transmitted from the wheels to a payload thus giving many times more power than if only the left wheel or even two such wheels be used as a hydraulic turbine.

It is obvious that this naive idea breaks the law of energy conservation. A turbine with two such the wheels will not start rotating even without a payload. However, Treshchalov actively promotes his imaginary "hydraulic effect" as an established scientific fact. He focuses exclusively to the theoretical arguments and refuses from carrying out full-scale experiments, though his hydro-turbine is not more complicated than a bicycle. But the worst of all is that this pseudoscientist aggressively attacks the critics using dirty intrigues, insults and persecutions on the Internet, delations in governmental and other organizations, statements to the police, etc.

Acting in such a manner Treshchalov managed to publish 4 articles in "International Scientific Journal for Alternative Energy and Ecology" (Russia), the private (A.L. Gusev is the only owner), electronic, scientific journal that publishes articles of nearly any quality for a fee.

1. Treshchalov G.V. A highly efficient method for deriving energy from a free-flow liquid on the basis of the specific hydrodynamic effect // International Scientific Journal for Alternative Energy and Ecology - 2010.- №12.- P. 23-29
2. Treshchalov G.V. Research into the hydrodynamic effect of boosting power and its full-scale modelling // International Scientific Journal for Alternative Energy and Ecology – 2012 - № 11. - P. 41-44.
3. Трещалов Г.В. Анализ возможности натурального моделирования режимов работы гидравлической турбины, использующей гидродинамический эффект усиления мощности // Альтернативная энергетика и экология - 2012. - № 11. - С. 37-40. (in Russian)
4. Трещалов Г.В. Применение гидродинамического эффекта Трещалова в свободнопоточных гидротурбинах // Альтернативная энергетика и экология - 2013. - № 3/2. - С. 95-98 (in Russian)

In June 2013 I published in this journal 2 articles which unmask the fake invention of Treshchalov. The main of them was:

Zot'ev D.B. **Alternative energy vs pseudoscience** // International Scientific Journal for Alternative Energy and Ecology – 2013 - № 8 - P. 131-136. (in Russian)

Soon after that Treshchalov came into contact with Sokolov who instantly became an active defender of this idea. It seemed to Sokolov that he has found serious mistakes in my criticisms, and on this base he started inflating the giant and dirty bubble of claims to my academic qualification, having taken Treshchalov under his wing in fact. In October 2013 he published the article:

Igor Sokolov, The energy conservation law in hydrodynamics vs the pseudo-law of alternative energy. Comment on «Alternative energy vs pseudoscience» and the paper cited and not cited therein // <http://arxiv.org/ftp/arxiv/papers/1312/1312.5780.pdf> .

In fact this was a contr-criticism to my article highlighted in red above, though the article by Sokolov looks as an impartial analysis of a number of publications in ISJAEE. He writes in the annotation:

“A series of papers in the ISJAEE Journal on “dam-free hydroelectric power station” concluded by paper: Zotyev, D. B., “Alternative energy vs pseudo-science”, is reviewed and commented. A comparison with the generally accepted energy conservation law in hydrodynamics reveals a disappointingly low scientific level of the reviewed papers (both pro and contra the dam-free concept), not excluding the published peer-reviewer reports.”

The self-confident proposition about the "disappointingly low scientific level" of my article (together with others) should be, in fact, related to the article by Sokolov. Trying to find blunders in my articles [9,10] he had made rough mistakes in his own. In present text the article [10] is highlighted in red (see above). Sokolov writes just before the equation (4):

“However, in the applications under discussion we are interested in such a case when in a steady flow (d/dt=0) there "increases" not the energy of stream but the "non-hydrodynamic" energy that is produced by the stream energy, being a result of the produced electrical power E and the energy losses W that are dissipated in all the sources:”

$$E+W=\int\left[\rho\vec{u}\left(\frac{u^2}{2}+gh\right)+\vec{u}P\right]\cdot d\vec{S}_1-\int\left[\rho\vec{u}\left(\frac{u^2}{2}+gh\right)+\vec{u}P\right]\cdot d\vec{S}_2 \quad (4)$$

From (4) the author obtains the **only** source of his snobby accusations me of the hydrodynamical ignorance and, furthermore, the absence of scientific qualification. This source is the formula:

$$\frac{E+W}{L\rho H_1 u_1}=\left(gH_1+\frac{u_1^2}{2}\right)-\left(gH_2+\frac{u_2^2}{2}\right) \quad (5)$$

where  $L$  is the flow width,  $\rho$  is the density of water,  $\vec{u}_1, \vec{u}_2, H_1, H_2$  were determined above (on the figure  $V1 = u_1$  and  $V2 = u_2$  ).

According to Sokolov, formula (5) gives the common specific power of a payload and losses ( $E + W$  per 1 kg of the water). This formula represents the mathematical essence of Treshchalov's idea, it can be found in all the articles by Treshchalov.

But Sokolov was grossly **mistaken** in the derivation of (4). Indeed, the well-known energy equation in hydrodynamics looks as follows:

$$\frac{\partial}{\partial t}(T + V) = -\iint_{\partial\Omega} \rho \cdot \left( \frac{u^2}{2} + gh \right) \cdot \vec{u} d\vec{S} - \iint_{\partial\Omega} P \cdot \vec{u} d\vec{S} \quad , \quad (*)$$

where  $T$  and  $V$  is the kinetic and potential energy of the water inside a domain  $\Omega$ ,  $\vec{u}$  is its velocity and  $P$  is the pressure,  $h$  is the vertical distance from the bottom of the stream. Let  $\Omega$  be the domain between the vertical sections  $S_1$  and  $S_2$  (on the figure above  $H1$  and  $H2$ ). If the left part (\*) is positive, this can be interpreted as  $E + W$  (4). Assuming the upper and the lower boundary of  $\Omega$  are invariant under the flow, the right part (4) directly results from integral (\*).

The **blunder** is that Sokolov has to had taken into account the blades of wheels submerged into the water, considering them as the pieces of  $\partial\Omega$ . It easy to see that integral (\*) over the surfaces of these blades is not equal to zero. It would be zero only in a static or quazi-static situation, when  $P$  is entirely determined by the hydrostatic pressure and the submerged pieces of blades are uniformly covered by the water. Obviously, it is not the case! Ignoring the blades of wheels, Sokolov comes into a contradiction to hydrodynamics and so receives **false** formula (5).

The correct formula can be obtained from quite elementary physical considerations:

$$\frac{E + W}{L\rho H_1 u_1} = \left( \frac{gH_1}{2} + \frac{u_1^2}{2} \right) - \left( \frac{gH_2}{2} + \frac{u_2^2}{2} \right) \quad (5*)$$

Thus, the edifying tone of the article is unfounded. Sokolov writes right before (6) and belowt:

“Here the outcoming flow of the energy can be significantly less than the incoming one, which means the efficient conversion of the energy :

$$E + W = \rho L u_1 g H_1^2 \left( 1 + \frac{Fr}{2} - \frac{3}{2} Fr^{\frac{1}{3}} \right) \quad (6)$$

Conversely, the power efficiency of the "power-station" is negligible in the case of small difference between the output energy flow and the input (when  $H_2 \approx H_1$ ) “.

This is a very important place in the article by Sokolov! Here he clearly and definitely **supports** the idea of Treshchalov. Criticisms is also presented in the article to create the illusion

of objectivity. But nowhere Sokolov explicitly recognizes the idea of Treshchalov to be false and his two-wheel turbine unworkable in principle, as it was done in my texts [6,9,10]. Sokolov only expresses doubts that the value of  $E+W$  will be positive, not definitely denying this. Thus he had left for Treshchalov the possibility of continuing theoretical speculations around his pseudo-invention. The spear of Sokolov's criticism was first of all aimed against my texts [6,9,10], which had clearly and convincingly uncovered this scientific scam. To support of Treshchalov he has chosen my reputation as the main target. Sokolov writes at the beginning of the section **3. Articles [2-10]** :

“Having regard to the aforesaid truisms of the training nature, let's consider, beginning with the last, all the works from the series [1-10]. In [9-10] (the same in [6]) in the flow of energy the term with pressure has been lost, thus resulting in a triple error:

- 1) publications [2-5] are unreasonably criticized for the neglect of the work needed for changing the kinetic energy of flow (...);
- 2) equations (5-6) are criticized;
- 3) it is stated that the "critical" value of Froude number for which the energy extraction from the flow must be accompanied by an acceleration of the flow, is equal to  $\frac{1}{2}$  but not 1.”

It is worth to pay attention to the shockingly arrogant style of Sokolov. Amongst "the aforesaid truisms of the training nature" there is not contained the following. The flow of water, which does not interact with the blades of a turbine, is not able of changing its speed and depth in a horizontal channel of constant cross section. If this truism has been taken into account, Sokolov would not have committed the stupidity while obtaining the right part (4) from the surface integral (\*). Such a brilliant specialist in hydrodynamics would have surely realized that the upper boundary of a flow, in which there rotate the blades of a turbine, should be non-stationary, turbulent and having cavities. Realizing this, he would have refused from attempting to elementary calculate the flow power in domain  $\Omega$  (the left part (\*)). Then Sokolov would easily obtain the right formula (5\*) instead of the false formula (5) and (6) correspondingly. Accordingly, the critical value of Froude number would turned out equal to  $\frac{1}{2}$ , but not 1.

Thus, the criticism of my article revolves around formula (5\*), which is erroneous according to Sokolov. But the fallacy of Treshchalov does not depend on which of the formulas (5) and (5\*) is used in assessing the decrease of water energy while passing through the two-wheel turbine. In the texts [6,9,10] I have proved that the right part (5\*) will always be **negative**. An analogous result is easily to derive for the formula (5). Indeed, imagine that Treshchalov turbine was placed onto a planet with gravity two times more than that of the Earth. Then, for  $g'=2g$  formula (5\*) looks just as (5). The turbine will not operate neither on this planet nor on the Earth because of breaking the law of energy conservation. It can rotate only after receiving an external

torque, but the rotation will stop in some time. This has been rigorously proved in my articles without using of formula (5\*).

Thanks to me for discussions that Sokolov expresses at the end of the article is an example of his **Jesuitic** style. I never discussed it with Sokolov and did not have business contacts to him. All his letters to me are automatically sent to spam.

Thus, Sokolov not only tried to discredit my publications on the basis of his own mistakes (!), but also had created a smokescreen over the reasons because of which the Treshchalov pseudo-invention cannot be operational. In fact, Sokolov gave this charlatan an academic support and the possibility of effectively persecuting me. But this purposeful man had not stopped at the scientific (though erroneous) criticism, despite of the fact that I never knew of his existence before. Acting in coordination with Treshchalov, Sokolov has been haunting me in Russia for nearly 2 years!

In October 2013 he began spreading slanderous letters about me, sending them to the Prime Minister and the President of Russia, the Ministry of Education and Science of Russia, Moscow Power Engineering Institute (where I was working then), Lomonosov Moscow State University (where I granted degrees of Ph.D. and D.Sci. in mathematics) and to many other persons and organizations. Sokolov wrote that D.B. Zot'ev is unskilled and ignorant scientist who does not know neither physics nor math, my D.Sci. is undeserved and so on. Thus, utilizing the imaginary error in formula (5\*) as the main argument, Sokolov and Treshchalov have inflated a dirty bubble of accusations against me.

Furthermore, Sokolov began blackmailing the owner of the magazine ISJAEE (A.L. Gusev) and writing denunciations of him to the Ministry of Education and Science of Russia. This person definitely loves the whistleblowing! Sokolov accused Gusev that his journal published my critical articles. In February 2014 frightened Gusev proposed as a compromise to publish debates between Treshchalov, Sokolov and me (see "Invitation from Gusev.pdf"). Soon Sokolov realized that not me but he grossly mistaken in the derivation of formulas (4) and (5), therefore in the course of this debate he would look like a smug fool. But instead of to bring me apologizes and end the conflict, Sokolov undertook frenzied efforts to **derail** this discussion. He began pursuing the editorial office and personally Gusev, blackmailing him with a possible denunciation to the FBI. Eventually the owner of ISJAEE became so seriously intimidated by Sokolov, that 27 March 2015 he gave up the debate though I was categorically contra. The evidence is the screenshots of my correspondence with Gusev, in which he complains about the scandalous and provocative behavior of Sokolov (attachments 1 - 4).

But after that Sokolov has not calmed down. Having left the subject of "Treshchalov effect", he frantically began searching for the errors of my doctoral dissertation. But Sokolov did not find anything, except one or two insignificant typos, because in my thesis there are no errors.

In addition, despite of the monstrous aplomb, the real scientific level of this person is not enough for understanding my works. But Sokolov perfectly masters the art of web-trolling. He utilizes any insignificant and formal reasons, often invented by himself, and without hesitation distorts cards to loudly accuse an opponent. An example of this dishonest, deceitful and provocative style is the next critical article

<http://www.physics-online.ru/PaperLogos/18708/CommentOnContactDegenaraciesForExpert.pdf>

that was published on the site

[http://www.physics-online.ru/php/paper.phtml?jrnid=null&paperid=18708?&option\\_lang=eng](http://www.physics-online.ru/php/paper.phtml?jrnid=null&paperid=18708?&option_lang=eng) ,

and, according to Sokolov's modus operandi, was "broadcasted" to many organizations including the Ministry of Education and Science of Russia.

This article is called "Comments on the work of D.B. Zot'ev "Contact singularities of electromagnetic field tensor",

link to D.B. Zot'ev "Contact singularities of electromagnetic field tensor" :

<http://www.physics-online.ru/PaperLogos/15555/%D1%F2%E0%F2%FC%FF%20%C4.%C1.%C7.pdf>

At the very beginning Sokolov smartly puts an incurable diagnosis:

“The electrodynamical application of the mathematical theory in [1] ignores the physical principles, such as the laws of conservation of electric charge and energy.”

The reference [1] leads to the same article published in the journal "MPEI Vestnic". In section **1. On covariance** the omnipresent critic invades the area where he is ignoramus.

After banal reasonings that the equations of physics have to be covariant, Sokolov writes:

“Contrary to these rules in [1] there are used noncovariant concepts such as "Definition 1. There is given a closed differential 2-form  $\omega$  ...” further a form is given, bilinear in  $dx^i$  and linear in the components of a field tensor  $F_{ij}$ . As long as the used designations of the type  $dx^i \wedge dx^j$  have not been given a covariant sense, the definition is already not covariant. Really, the differentials  $dx^i$  are the components of 4-vector, therefore the only covariant expression for such a form would be  $\omega = F_{ih} dx^i dx^j$  - but such a form is equal to zero:

$F_{ih} dx^i dx^j \equiv 0$  by virtue of the antisymmetry of the tensor  $F_{ij}$  .”

It is clearly seen that Sokolov is not familiar with the concept of the exterior product of differential forms, that is designated  $\wedge$  . Sokolov also does not know what is the differential of

a form and, in particular, the differential of a function, because he believes  $dx^i$  is a vector, but it is a co-vector (differential 1-form). He has written a **stupidity** about  $\omega = F_{ih} dx^i dx^j$ , because such the expressions are never used. The differential 2-form  $\omega = F_{ih} dx^i \wedge dx^j$  is not equal to zero of course! Sokolov evidently has never heard that a covariant tensor of electromagnetic field is a differential 2-form.

Thus, Sokolov is not familiar with differential forms and their applications in electrodynamics. His statement about the lack of covariance in my article [1] is erroneous and entirely **illiterate**. Evidently, the obsessive desire of Sokolov to besmirch my scientific reputation totally dominates over his scientific integrity, if one can speak of the latter in relation to that person.

In section **2. Currents create fields or fields define currents?** Sokolov inflates another bubble. From a mathematical point of view there is no difference! Here he looks like a medieval scholastic who is concerned by the problem: is a chicken primary or an egg? But the truth is that Sokolov utilizes any occasion for criticism, thus behaving like a web-troll. Then he accuses me of violating the laws of conservation of energy and charge, although it nowhere supposed in [1] that the systems in question are closed. Sokolov invented himself that these systems are closed, whereupon raised the indignant cry about the violation the basic principles of physics. He often uses this sneaky trick! The word cry is quite adequate, because such sharply negative articles about me Sokolov sends to many organizations including governmental and scientific.

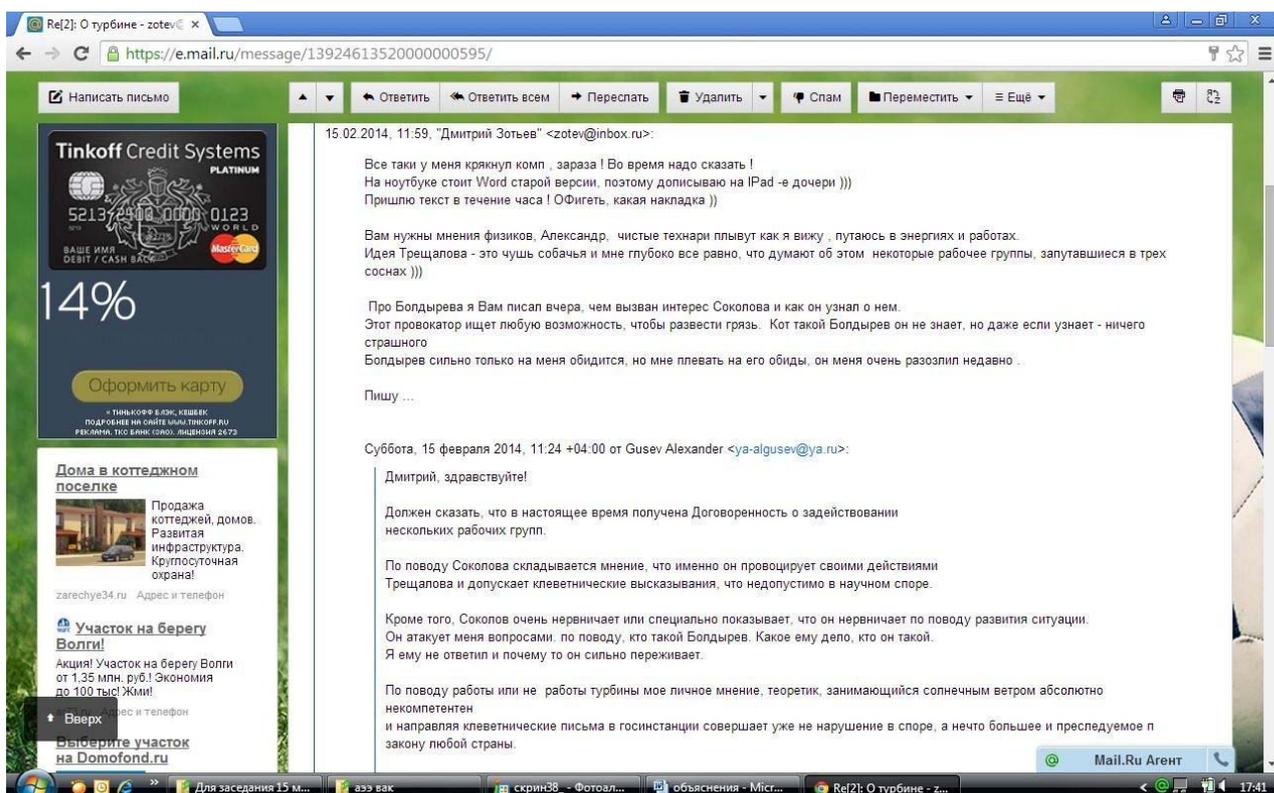
In section **3. whether [1] is applicable to electrodynamics?** Sokolov repeats the nonsense about non-covariance and the lying about the violation of the laws of conservation of energy and charge. In addition he lies that my results were obtained by other scientists.

Thus, his snobby epithet "disappointingly low scientific level" (see above) is applicable to this article. It contains nothing except lies and nonsense.

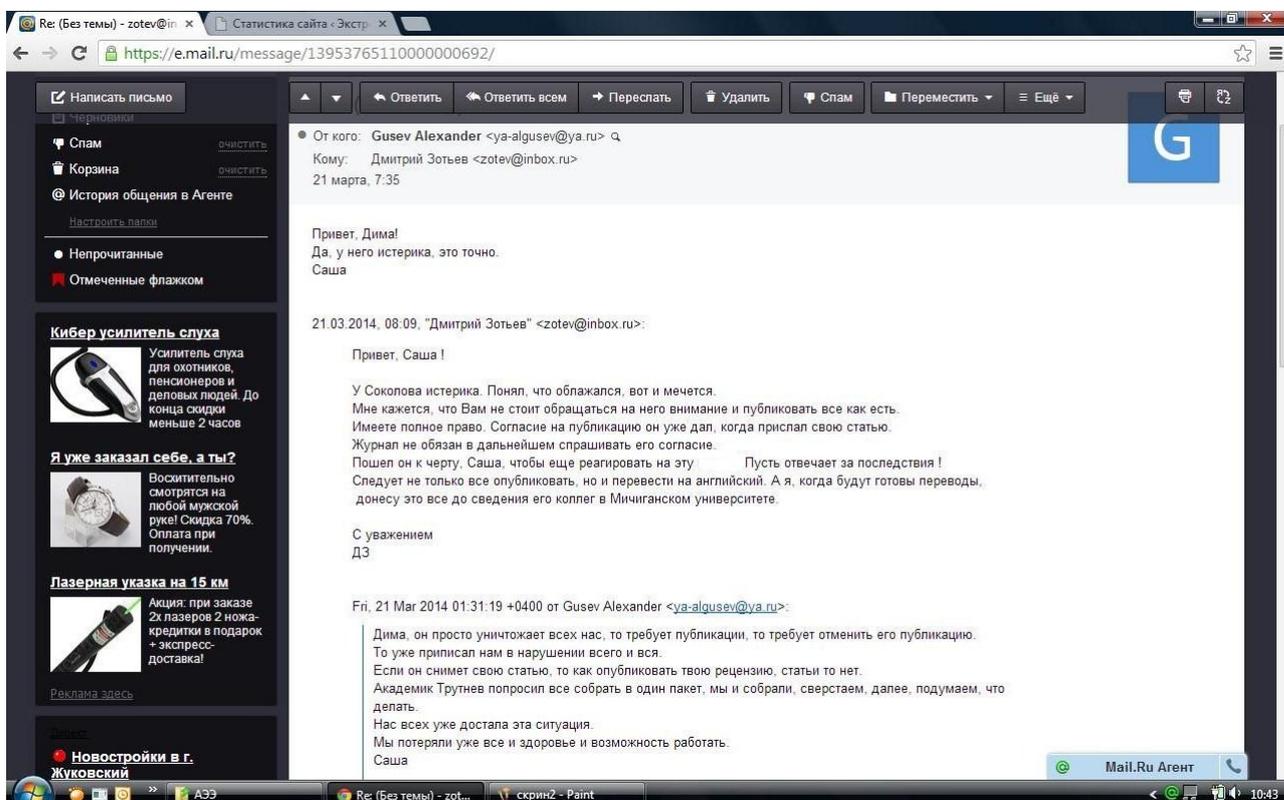
In early 2015 Sokolov sent to the dissertational council Д.501.001.84 at Lomonosov Moscow State University the application criticizing my doctoral dissertation and demanding to deprive me of a scientific degree and to suspend it during the investigation. This text is attached in the file "Sokolov MSU.pdf", my response is attached in the file "Response to Sokolov.pdf". There was no effect, but restless Sokolov continues to put pressure on the university.

I have no doubt that Igor Sokolov <http://aoss.engin.umich.edu/people/igorsok> is liar, provocateur and dirty schemer. A man without honor! I am convinced that such a person has no place in the scientific community, and his presence dishonours the University of Michigan.

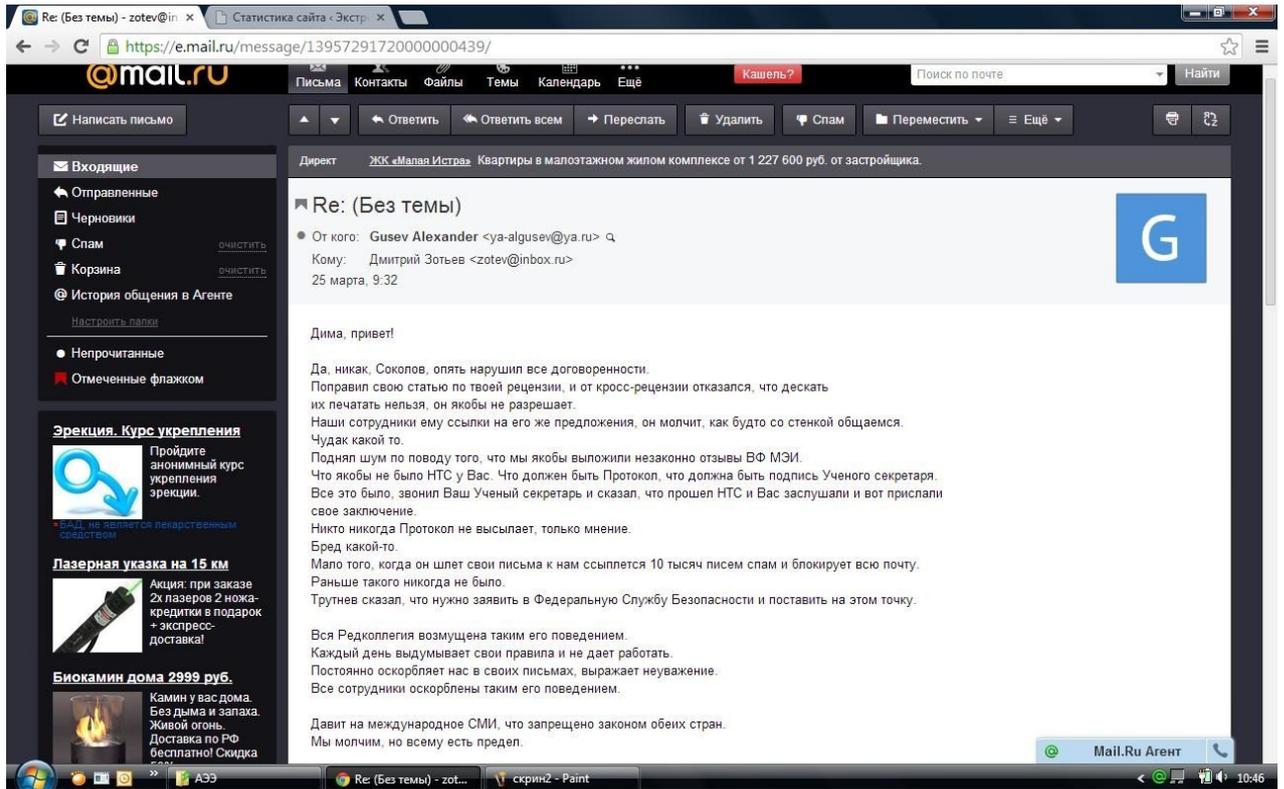
# Attachment 1



# Attachment 2



### Attachment 3



### Attachment 4

