REVIEWS ON THE MANUSCRIPT [18]

Reviewer 1:

Details to be clarified

Introduction

"research of waters' properties": change to "the properties of water".

Apparatus

It is known that laser light is highly polarized (http://en.wikipedia.org/wiki/Polarization_%28waves%29).

It is also known that that the intensity of the reflected beam depends on the polarization of the incident beam.

Was this fact taken into account when the experimental setup was constructed? Is this important or not? Would the behavior of the system change if non-polarized light is used? It is also connected to the Formula 1?

Measuring the intensity of light

"Since some materials absorb the light that passes through them, glass plates were used": reconsider this sentence. How the fact that some substances absorb light is connected with usage of glass plates?

Please give descriptions for each notation of a physical quantity before introducing it into calculations or into theoretical descriptions (*I* as intensity etc.).

Dependence: Intensity of light – coefficient

The graph 3: change the axis labels.

Influence of the radius of the nozzle

The paper does not mention why the water flow can be described as a set of parabolas.

Please explain and justify with the facts proving that other features of flow (the viscous interaction in water etc.) can be neglected in such a description.

Review

The paper provides a description of the optical part of the effect.

The author considered the reflections and refractions of beams, built a computer model, and proved the theory with experimental measurements.

The paper, however, has completely insufficient information on the hydrodynamic part of the effect.

Try not focusing on the properties of a particular experimental setup (level of the water, size of the hole, etc.) but on the properties of the water jet. These include the initial speed (you may neglect its Poiseuille velocity profile and give the average initial speed) and initial radius.

Try connecting your parameter "parabola coefficient" with these properties of the jet.

You devote less attention to the photo resistor calibration; it is not connected with your goals and the physical effect itself.

The article is recommended for publishing only if the suggested changes are made.

Reviewer 2:

Please provide references for “Figure 1: Colladons' apparatus”.

“**Goal was to determine how the length of laminar part of the jet (part which can transfer the light) depends on the shape of the jet.”** The laminar part does not necessarily transfer the light. Although explained later, this sentence seems to need a bit of revision.

“**length of “dark” part of jet was measured.”** Please clarify if you mean the height of this point or explain what exactly you mean.

“**As the shape of jet changed the intensity of light that stays inside also changed.”** Unclear sentence.

“**It was measured always on the same vertical level in “black” part of jet.”** It may help if you mention the level in centimeters.

“**The dependence is not linear and it was necessary to calibrate it.”** The dependence of what on what? Please explain.

The calibration was quite unclear. Please define “Resistance” (electrical?) and explain what conclusion or application you extract from figures 2 and 3. Are you assuming the absorption energy is proportional to the number of the glass plates?

“**It was known that the dependence of voltage on intensity was linear.”** Light intensity or the intensity of the electrical current?

Please explain more about the photo resistor and the way of its application in your setup. I cannot imagine where exactly the photo sensor was placed and how does it absorb all the light. (Figure 4 does not help!)

“**Computer Simulation”:** You mention that the first reflection has the lowest angle of incidence, so if the ray gets reflected first time, it will reflect later. Your reason for this statement (that the highest curvature is present in the first reflection) does not seem to be enough, although it suggests your assumption as an acceptable “guess”. I suggest you to remove the definite statements and suggest this as an assumption which will be confirmed experimentally. Otherwise, a better mathematical proof is needed.

Provide references and a better description on the Plateau-Rayleigh instability.

I suggest the “theory” to be placed before the “Computer Simulation” in the manuscript, since all the issues mentioned in the theory are prerequisites for the computer simulation.

“**As criteria of a good light guide it was taken a number of 30% of initial intensity that has to be preserved.”** Mention if this is your own assumption or if it is based on some reference.

Consider checking the graphs. Pictures containing texts with lines below them are irritating! Also correct the axis title of graph 3. I also suggest you to use more descriptive axis titles and let the Graphs represent the data independent to the text, e.g. one would not understand what you mean by “coefficient” as the axis titles without reading the text. So I suggest using “Water Path Parabola Coefficient” for example.

About the instability position, is it only a function of the parabola coefficient? Do other parameters (e.g. nozzle diameter, surface tension) also affect this position? Can you apply Graph 4 to a general case or is it only applicable in your specific conditions? Mention your exact specific conditions if it is important.

“**Conclusion”:** You have concluded that larger radius of the nozzle causes a better light guide condition because the coefficient of the parabola decreases. However, there is also another effect caused by the increase of the jet diameter, and it is that the light touches the surface in a position with a larger horizontal distance, which could mean the angle of incidence decreases, decreasing chances of total reflection. So a sum of these two effects must be considered, and it’s not that easy to judge about the effect of nozzle diameter.

Reviewer 3

Comments & suggestions:

The article focuses on the experimental part of analysis of the light guide.

The number of conducted experiments is high. The theory corresponds well to the experiments, although it could be described more thoroughly.

- Change introduction to “abstract”. Add to the abstract a few sentences describing your solution and summarizing briefly your results.
- There is no error analysis in the experimental part (for example “coefficient of parabola = 0.2” – exactly 0.2? Provide estimation for the error of such non-intuitive parameters (how much the measurement errors may change its value.) What is the accuracy of estimating this coefficient?
- Figure 2 is unclear. It will be probably not visible in print. Is there any possibility to adjust the brightness and contrast, or to mark the important parts on it?
- Attach a chapter with a discussion of limitations of your solution (descriptions of limitations is scattered through the article).
- How does your light guide correspond to real fiber-optic cables?

Style & structure:

Text has rather well understandable structure. The language is sometimes unclear, unspecific in particular. Revise the language, possibly with a technical dictionary / translator.

Literature:

The author does not refer in the text to any literature or external sources, which is a drawback of the article. Through the text, the links to the literature should be made, for instance to Colladons' apparatus, Plateau-Rayleigh fluctuations, etc.

Recommendations:

The manuscript is recommended for publication only after revision (see the comments part).

Editorial request

References: The list of references is not typeset properly. Please type the references in a way that the readers may immediately understand where and how they may look for a document. If all references are books, add the names of publishers and the years of publication. Consider adding URLs if the books are available online.

What parts of the manuscript cite or rely on each of the references?

Figure 1: provide a reference to the source of the image.

Figure 4 (right): consider adding a scale bar.

Graph 3: improve the legend and translate the Croatian notations.