



**SDI Review Form 1.6**

**PART 1:**

Journal Name:	<b><u>Physical Review &amp; Research International</u></b>
Manuscript Number:	<b>MS: 2013_PRR1_3157</b>
Title of the Manuscript:	<b>Charged Black Holes with Yang-Mills Hair and Their Thermodynamics</b>

**General guideline for Peer Review process is available in this link:**

**(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)**

- This form has total 9 parts. Kindly note that you should use all the parts of this review form.



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### **PART 2:** Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Compulsory</b> REVISION comments	<p>(1) Line 102: It seems that the correct definition of the (dimensionless) parameter <math>q</math> should be: <math>q=Q/r_H</math>.</p> <p>(2) Line 109 Eq. (9): It seems that the expression <math>2(1+q^2)</math> should be corrected to <math>(1+q^2)/2</math> [see Eq (5) with <math>f=0</math>].</p> <p>(3) Line 116: The authors claim that in the extremal case, <math>w'(r)</math> diverges at the horizon. I believe that it would improve the quality of the paper if the authors could provide an analytical proof for this claim.</p> <p>(4) Line 149 Eq. (11): The expression which is presented for the black-hole entropy seems odd. It is well-known that the black-hole entropy is given by <math>A/4\hbar</math>, where <math>A</math> is the horizon surface area. Thus, the black-hole entropy should be given by <math>\pi (r_H)^2</math>.</p> <p>(5) Line 175: The authors claim that: "For an isolated colored black hole, the heat capacity change its signs two times when the mass changes." I would like to ask the authors to provide a new figure with the heat capacity of the black holes which are studied in the present manuscript.</p>	<p>(1) This typo has been corrected as suggested.</p> <p>(2) This typo has been corrected as suggested.</p> <p>(3) This has been found numerically and is consistent with an analytical study but it is difficult to find the behavior analytically.</p> <p>(4) The definition of the entropy here is according to Moss and Wray, PRD46 R1215, this is considered to include the contribution of electric field.</p> <p>(5) The 2<sup>nd</sup> order phase transition about YMBH is not new, and we come to considering that the analysis of phase transition on the present system is to be published separately with some details. Therefore we discard this part in the present paper.</p>
<b>Minor</b> REVISION comments	<p>(1) Line 26: It seems more appropriate to replace the word "thermodynamics" by the word "physics".</p>	<p>We agree, and replace the word as suggested.</p>



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	<p>(2) Line 144 Eq. (10); I believe that it would improve the quality of the paper if the authors could provide a clear derivation of Eq. (10).</p> <p>(3) Line 184: It seems that the word "the" at the end of the line should be changed to "of".</p>	<p>Thus, the detail will be provided in a separate paper.</p> <p>We agree, and replace the word as suggested.</p>
<b><u>Optional/General</u></b> comments		