

# AuthorsComments.txt

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## 1 Editor's comments

In response to the editor's comments, I have amended the text in §3.1. However, I think that the derivation of the even result should remain as it is, since to do otherwise would be a disservice to the reader who wishes to understand where the form of solution that has been obtained comes from.

## 2 First referee's comments

In response to the first referee's comments, I would first like to express my immense gratitude to the referee, for reading my paper so carefully, and providing such extensive and helpful criticism, which has enabled me to improve the standard of the paper in so many places: I cannot thank the referee nearly enough for the considerable time that they must have spent on this, and the very considerable improvement in the content in the paper that has resulted. In regard to the specific comments made, I have the following remarks:

### General comments

I have included a distributional discussion of the fundamental solution approach in §2, which I hope is now mathematically satisfactory.

§2 now also contains a brief discussion of uniqueness and the scheme adopted to choose a specific solution. I have entirely rewritten §3.3 to address this comment: the later discussions of the constant are now strictly verification of local behaviour.

I have changed the notation to be as consistent as possible, although as the editor is no doubt aware, some overlap is inevitable when using results from different areas of mathematics.

I have reconsidered the various notations used; I hope all notation in the manuscript is now sufficiently defined.

I have added back variables to functions in all cases but where to do so would with spacing requirements, and specifically indicated where this has occurred. I have clarified definitions as much as possible without abusing mathematical grammar.

The general radius case is now considered throughout, and flat-space limits are discussed in several places, including §3.3 and pp. 9, 10.

The author is puzzled by the referee's comment about applications, since neither Cohl's paper nor Szmekowski's includes any, and we consider applications to two other spaces in §5.

§4 has been completely rewritten to reflect this comment, with theorems, lemmata and proofs in standard order, rather than the original expository style.

**Specific comments** (omitted bullets have been acted upon without any remark felt necessary):

- Sentence structures have been altered to address the first four points.
- Equation numbers have been removed in cases where not explicitly referred to.
- Language has been adjusted in most cases highlighted, but the author is somewhat puzzled by how else one would refer to half-integers that are not integers than “proper”, in analogy with other uses of “proper” in mathematics, such as “proper subset”.
- The author was under the impression that the standard and correct notation for the inverse tangent is “ $\arg \tanh$ ”, see e.g. Hardy, “The integration of functions of a single variable”, p.6; Spivak, “Calculus”, p.350; Pearson, “Handbook of Applied Mathematics”, p.37. There are also many papers on arXiv that use this notation, such as, e.g., Merle & Zaag, arXiv:1309.7756v3. As Pringsheim, Faber and Molk remark in their article in the “Encyclopédie des sciences mathématiques”, (Tome II, Vol. II, p.80), “The notation  $\arg z$  also in use is incorrect, because the inverse function of  $\sinh z$  is not defined via an arc.” As far as the author is aware, there is also no standard notation for the cyclic groups (see, for example, the second paragraph of <http://mathworld.wolfram.com/CyclicGroup.html> ).

p.2, l.19 The notation the referee objects to has been clarified and disambiguated.

p.2, l.-6 has been reworded.

p.3, l.3 It is the author’s understanding that charts are maps from open sets; the sentence has been rewritten to clarify what is essential.

p.3, §3.1, l.-1 Section has been rewritten to clarify this.

p.4, l.-7 Sentence reworded to clarify that it is the form of the expressions being discussed.

p.4, l.-2 Have reinstated variables in all but the most crowded of expressions, with clear indication of the abbreviations made when necessary.

p.9, Remark 1 Clarification of the difference in sign convention has been made, along with correcting a typo as suggested by the second referee, and writing out Szmytkowski’s solution explicitly in their notation.

p.10, l.14 Citations have been altered as suggested.

p.11 Section has been rewritten entirely.

p.11, §5 Section has been transformed into a subsection of the next section, concerning applications to problems beyond that originally discussed.

p.12, §6 has been supplemented with additional formulae, references to earlier sections, and explanation: I hope that this has clarified the derivation.

p.13, 14, Appendix A. Notation has been changed to be less ambiguous. The author is aware that parts of this result are known, but has never seen the full classification noted; he would be grateful if the referee would provide a citation.

p.15 Appendix B has been removed as no longer relevant to the derivation, since a closed form has now been obtained.

References have been amended as recommended.

### 3 Second referee's comments

In response to the second referee's comments, I have acted on all their recommendations. In particular, Remark 1 now covers both the  $n = 2$  and  $n = 4$  cases, and I have included Remark 2 to compare the  $n = 3$  and  $n = 5$  cases. I have also totally rewritten the odd case derivation. I would like to thank the referee for their suggestions, which have brought about a more convincing test of the consistency of my solutions with those of Szmytkowski, as well as the other minor mistakes that I have been able to correct.