

To Joel L. Lebowitz, editor-in-chief of Journal of Statistical Physics

Re: our article “Duality Theorems Used in Percolation”, which we sent to JSP on September 26, 2002, which was assigned code JSP 102-223 and sent to two referees, one of whom never responded.

Dear Joel:

Please, find attached a new version of our article. Please, notice that we have changed the title. The new copyright transfer statement is in the mail.

We have read attentively the comments of our only referee, whom we shall call R for short. R’s corrections of our misprints and mistakes were very helpful. We have thankfully accepted practically all of them. What about R’s other criticisms, we tried to comply with them as much as possible. Below is a list of R’s criticismss (in italics) and our reactions to them (in plain roman).

The authors are not familiar with universally accepted terminology and careful distinctions used in the field. They fail to make a distinction between a graph and a percolation model on a graph.

Authors: The phrase “percolation model” really is used in some articles, but not very often. Search of MathSciNet for percolation gives more than a thousand items and for percolation model it gives 69 items. However, we found this phrase useful in our case and included it in various places of our article.

They fail to make a distinction between a planar graph and a planar representation of a graph.

Authors: This distinction was made by us and now is made still more clear.

They fail to make a distinction between dual graphs and dual percolation models.

Authors: We took care of this. See above.

The authors do not seem to be familiar with the literature on the subject. Only six references are given, with two by one of the co-authors. The most recent reference other than the co-authors is dated 1982.

Authors: Our article is not a survey, so it is not our duty to inform the reader about all the literature in a certain area. If the purpose of an article is to present a new proof, as in our case, it is sufficient to refer only to those publications, which are necessary to support the arguments. In this sense we don't need even some of those references which we had already included. However, the list of references is increased.

The authors fail to successfully make a case for the need for their paper. They claim that the duality results have been used previously, but not proved. However, they do not provide any references or other evidence of their previous use.

Authors: We apologize for this omission. Now we include two references and two examples illustrating use of our statements.

The paper was poorly proofread, with many typographical, spelling, and grammatical errors (even allowing for the fact that the authors are not native English speakers). For example, several misspelled words are spelled correctly multiple times.

Authors: We apologize and cordially thank R for corrections. All of them are accepted.

At the bottom of page 1: *The last sentence is not supported by any evidence. If the authors claim there are omissions in the literature, they need to provide references...*

Authors: References to omissions? An original requirement. Anyway, we did what we could.

A. This is a non-standard definition of the terms. The criteria deal with the random mechanism used to create a percolation model, not with the graph itself. This should be rephrased to be defining oriented and non-oriented percolation models, or to define an orientation of a graph and/or a labelling of the edges in a graph.

Authors: We have changed our text so as to satisfy this pedantry as much as possible.

B. This paragraph intermingles definitions of graph properties and properties of path in a percolation model.

Authors: Same answer as to item A. We have sorted it out.

C. "Percolation" is usually used to indicate that there exists an infinite open path. These non-standard definitions may be confusing to readers.

Authors: We changed our terms to avoid any confusion.

D. There is a distinction between "planar" and "having a planar representation"

for a graph. A planar graph may be drawn in the plane so that its representation is not planar.

Authors: This distinction was made by us and now it is clarified still more.

E. This includes a definition in a part of a very long definition. I suggest that “piecewise affine” be defined separately before the definition of “drawn in the plane”. It would be natural to define it immediately after defining “curve”.

Authors: We have followed this suggestion.

F. This is ambiguous. I do not think you mean that e_i and e_j must have both ends in common. Please phrase this more carefully.

Authors: This is corrected.

G. A “limited” subset is not defined. Do you mean bounded ?

Authors: Yes, this is what we mean. We have corrected this throughout the article.

H. The definition of planar is very long, so there needs to be a clear indication where it ends.

Authors: Now the definition have a brace on the left side of it.

I. “Planar graph” is a well-established term, and should not be redefined differently. Readers may apply the theorems incorrectly if this different definition remains. I consider this to be a VERY SERIOUS problem.

Authors: We have corrected this.

J. With the standard definitions, $P(G)$ would equal the entire plane R^2 , because there are many representations of a graph, and even one particular representation can be translated to cover the plane.

Authors: This is corrected.

K. Three different concepts are called duality.

Authors: Yes, and we see nothing vicious about it. If you insist, we can substitute “dual” by “corresponding” or “dual-corresponding” in these contexts. Will it be better?

L. In 3, where reference is made to “edges”, what is meant is “representations of edges”.

Authors: Now this is corrected.

Sincerely yours

Pedro Ferreira de Lima and Andre Toom