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Yours sincerely,

Rosa Maria Spitaleri, Research Director
Editor in Chief
Mathematics and Computers in Simulation

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Reviewers' comments:

Editor: Thanks a lot for your submission to MATCOM. Reviewers are recommending a major revision of your paper. Please address all reviewers' concerns in detail, particularly those regarding novelty and advantages with respect to existing literature.

Reviewer #2: The accurate calculation of capacitances is a significant problem that spans through multiple scientific areas: computational electromagnetics, computational physics, applied mathematics etc.

In the manuscript, starting from (4) it is now known what is the domain of double and quadruple integrals, namely (4), (5), (6), (9), (10) and (11). Reading thought the manuscript one can understand that the boundary surface is divided into multiple squares or tiles, (i.e., meshing of the boundary surface), which further implies that the constant surfaces charge is assumed on each mesh element. The authors should clearly indicate what is the domain of the integration of double and quadruple integrals. Further, the authors should clearly state what are the "basis functions" for the approximation of the distribution of the surface charges.

The step between (11) and (12) seems to be the crucial for the presented work, yet very little is said about how that solution is obtained. The authors should provide further details, and comment how the accuracy of calculation of erf-function in (12) affects the overall accuracy of the calculation of capacitances. A comment on how many significant digits are used for erf-function is used is needed, too.

Since the authors state that the accurate calculation of capacitances is of interest, complementary to Figs. 3 and 5 they should provide the number of significant digits of the results they obtained or some other numerical estimate of the accuracy of the capacitance that they calculate. Figs. 3 and 5 show monotonically increase of capacitance, but it is not clear if the results converge to the exact solution or to some other solution. The authors should compare their work the known results [34] and cross check the calculated capacitance if the number of tiles is one or two orders of magnitude higher than those presented in Figs. 3 and 5.

For the reasons stated above, the manuscript needs major revision.

Reviewer #3: Dear authors you have proposed the closed form solution for the quadruple integrals over rectangles for parallel and orthogonal case. The paper is well written but there is the following problem.
This calculation has been addressed many times in literature. For example in the following paper

"Z. Song, F. Duval, D. Su, and A. Louis, "Stable partial inductance calculation for partial element equivalent circuit modeling," Applied Computational Electromagnetics Society (ACES) Journal, vol. 25, no. 9, 2010., vol. 25, pp. 738-749, 2010"

the closed form solution for parallel and orhotogonal rectangles can be already found without any limitation on the coplanarity (please see the Table I of this paper where formulas are given in the 4D-1 and 4D-2 tab). In addition, the singularities can be simply handled by using the atan2 function and by considering that lim x->0 x log (x) = 0.

I'm sorry but I don't see a clear advantage to use your formulas (with coplanar limitation). Can you clearly explain this point?