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Short title: New properties of 9-point finite difference solution of the Laplace equation.

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Review text:

The author considers a finite difference scheme of 9 points on square grids to approximate the Laplace equation on rectangular region with Dirichlet boundary conditions. The case when the boundary functions are in $C^{5,1}$ is discussed. The necessary differential properties of the exact solution are also given. Two properties for the finite difference scheme considered by the author are derived. The first property is that the order is $h^6(1 + \ln |h|)$, in the maximum norm. The second property is that the stated order can not be obtained when for instance the boundary functions are only in the Hölder spaces $C^{5,\lambda}$, where $0 < \lambda < 1$. This is proved thanks to a suitable estimation below.