

Review Form 1.6

Journal Name:	Asian Research Journal of Mathematics
Manuscript Number:	Ms_ARJOM_81687
Title of the Manuscript:	A Comparison of Implicit and Modified Implicit Finite Difference Schemes for Solving Parabolic Equations
Type of the Article	

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

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PART 1: 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)
Compulsory REVISION comments	<p>The present work considers the implicit scheme and modi_ed implicit scheme for solving parabolic problems. The English is very poor. This scheme is already established and not new. This work has plenty of corrections. There are several mathematical queries which must be addressed in the revised version. The following queries must be addressed, before taking a decision.</p> <p>Corrections P=Page</p> <ol style="list-style-type: none"> 1. P1- Replace-"Most problem in Engineering, Physics, Fluid mechanics, Chemistry and other areas of application" by "Most of the problems in Engineering, Physics, Fluid mechanics, Chemistry and other areas of applications" 2. P1: It will be - "The solutions of these type of parabolic partial di_erential equations". 3. P1: It will be- "Since all the partial di_erential equations can not be solved analytically,...." 4. P1: It will be- "to get the very good approximate results" 5. P1 It will be -is an approximation method 6. P1- It will be - The process converts partial di_erential 7. P1: It will be - These schemes perform 8. P2: Replace it by "[6] modi_ed the simple explicit scheme and prove that it is much more stable compared to the simple explicit case which enables of using larger time steps." 9. P2: Replace it by- "Their method utilizes an extra grid point at the lower level... " 10. P2: It will be - considered the practical methods for numerical solutions 11. what is the order of convergence and its proof of the scheme (3)? It should be proved or mentioned from the following references. 12. P2: References section is very poor. There are plenty of implicit Euler based methods for parabolic problems which are much adaptive and advanced compared to preent method. These are- doi.org/10.1016/j.cam.2020.113116, http://doi.org/10.1002/ma.7369, http://doi.org/10.1002/ma.7358,https://doi.org/10.1080/10236198.2017.1420792, https://doi.org/10.1007/s11075-018-0557-4, https://doi.org/10.1016/j.cam.2015.04.034,DOI: 10.1007/s12591-017-0385-3. The authors must mention these papers in the revised version of this paper. 13. P2: It will be- Crank-Nicolson scheme, their method 14. P2: It will be - method. They include 15. 	

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	<p>P2: Order notation is not de_fined. 16. P2: The discretization of (1) is not clear. which one out of j and i is used for time and space. 17. P3: what is the guarantee that the matrix in (3) is invertible. You should refer {Applied Numerical Mathematics, 148, 79-97, 2020, J. Applied Mathematics and Computing, 41(1-2), 447-471, 2013, Int. J. Computational Methods, 9(4), 2012, doi:10.1142/S021987621250052, for invertibility of the M matrices and stability. 18. (6) does not require 4th order smoothness for the error analysis. small smoothness is sufficient. The present work is very well known. One will get the results in any books. This paper can not be published unless the authors refer them from the mentioned places. 19. P5: Typo- von-Neumann 20. There is nothing new in Section 2.5 and 2.6. Authors must refer the alternate stability analysis by M matrix from J. Comput. Appl. Math., 354, 533-544, 2019, BIT, 56, 51-76, 2016, Math. Methods Appl Sci, 41(14), 5359-5387, 2018, , CMES, 90(6), 463-485, 2013. Authors should mention them here for looking into the analysis for variable coefficients. 21. The order of convergence is not given in any of the tables. Either you compute those and refer the formulas from the papers- https://doi.org/10.1016/j.cam.2020.113167, appl. math. comp., 249, 265-277, 2014, Int. J. Computer Math., 92(3), 562-578, 2015 Aust. J. Math. Anal. Appl., 10(1), 1-17, 2013, Int. J. Computer Math., 97(10), 1994-2014, 2020, doi:10.1002/cmm4.1047, http://doi.org/10.1002/mma.7369. These papers need to be mentioned in the revised version for optimal and higher order convergence or different types of convergence analysis. 22. P10- It will be- Discussion 23. correct the english in Discussion 24. It will be - From the above results ... in the Conclusion.</p>	
Minor REVISION comments		
Optional/General comments		

PART 2:

	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)
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

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