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| Journal Name: | [**Journal of Advances in Mathematics and Computer Science**](https://journaljamcs.com/index.php/JAMCS) | | | |
| Manuscript Number: | **Ms\_JAMCS\_136975** | | | |
| Title of the Manuscript: | **The Numerical Solution for a Maxwell Integral Equation: MRI Brain Scan** | | | |
| Type of the Article |  | | | |
| **PART 1: Comments** | | | |
|  | | **Reviewer’s comment**  **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | **Author’s Feedback** (It is mandatory that authors should write his/her feedback here) |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | |  |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | |  |  |
| **Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.** | |  |  |
| **Is the manuscript scientifically, correct? Please write here.** | |  |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.** | |  |  |
| **Is the language/English quality of the article suitable for scholarly communications?** | |  |  |
| **Optional/General** comments | | 1. **The paper uses two methods (Gaussian Quadrature and Romberg’s integration) to approximate the Maxwell integral equation. Can the authors explain why they chose these two methods specifically, and whether other methods (e.g., adaptive quadrature or Monte Carlo) were considered?** 2. **The results from Gaussian Quadrature and Romberg’s method show significant differences. Can the authors provide more explanation about why Romberg’s method fails to converge properly, especially for time variations?** 3. **The model assumes constant or fixed values for some brain properties (like permeability and permittivity). How realistic are these assumptions for real MRI scans of different patients (e.g., children, elderly, or patients with disease)?** | 1. Line 101-102 and 129-130 2. Line 250-251 3. Line 209-210 4. Line 282-284 5. Line 259 6. Line 281-282 7. Line 273-276 8. Line 263-265 9. Line 256-257 10. Line 268 |
|  | | **4- The current analysis focuses only on grey matter. Could the authors discuss how the model might change when applied to white matter, or diseased brain tissues?** |  |
|  | | **5- The paper uses estimated values for magnetic permeability since there is no fixed value for gray matter. Can the authors justify their estimate, or explain how sensitive the model is to this assumption?** |  |
|  | | **6- The paper focuses on modeling the magnetic field from a given electric field. Could the authors also discuss the possibility of using the method in reverse — estimating the electric field from the magnetic field?** |  |
|  | | **7- How do the authors validate their models? Is there any comparison with real MRI data or other published computational models?** |  |

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|  | 1. **The paper claims that Gaussian Quadrature is "far superior" to Romberg's method. Could the authors**   **provide quantitative evidence (e.g., error analysis, computational time, memory usage) to support this statement?**   1. **Several results are presented using fitted polynomial models. Can the authors explain the degree of accuracy and potential limitations of these fitted equations outside the tested ranges?** 2. **The study considers the effect of single variable changes (like time, area, permittivity) while keeping others fixed. Have the authors tested interactions between multiple variables changing at once?** |  |

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| **PART 2:** | | |
|  | **Reviewer’s comment** | **Author’s Feedback** (It is mandatory that authors should write his/her feedback here) |
| **Are there ethical issues in this manuscript?** | *(If yes, Kindly please write down the ethical issues here in detail)* |  |