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| Book Name: | [**Physical Science: New Insights and Developments**](https://bookstore.bookpi.org/product/physical-science-new-insights-and-developments-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_5992** |
| Title of the Manuscript: | **CONVECTIONAL ONSET IN FERROFLUID LAYER THROUGH A DARCY-BRINKMAN POROUS MEDIUM** |
| Type of the Article | **Book Chapter** |

**Special note:**

**A research paper already published in a journal can be published as a Book Chapter in an expanded form with proper copyright approval.**

**Source Article:**

**This chapter is an extended version of the article published by the same author(s) in the following journal.**

**Journal of Basic and Applied Research in Biomedicine, 2(3): 246-254, 2016.**

**Available:** [**https://jbarbiomed.com/home/article/view/84**](https://jbarbiomed.com/home/article/view/84)

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| PART 1: Comments | | |
|  | Reviewer’s comment **Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. 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.** | The manuscript aims to analyze the convective instability in an incompressible ferrofluid layer permeating a Darcy-Brinkman porous medium under the influence of a uniform magnetic field and external heat source, employing perturbation techniques and normal mode analysis. Such studies are valuable to deeper understanding of magnetohydrodynamic (MHD) convection phenomena in porous media, which have applications in engineering and applied physics. However, while the topic is timely and potentially impactful, the current submission requires substantial improvements to meet the expected standards of publication in this domain. |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **acceptable** |  |
| 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. | **Can be improved** |  |
| **Is the manuscript scientifically, correct? Please write here.** | **See the comment below** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | **Should be improved** |  |
| Is the language/English quality of the article suitable for scholarly communications? | Should be verified |  |
| Optional/General comments | The manuscript aims to analyze the convective instability in an incompressible ferrofluid layer permeating a Darcy-Brinkman porous medium under the influence of a uniform magnetic field and external heat source, employing perturbation techniques and normal mode analysis. Such studies are valuable to deeper understanding of magnetohydrodynamic (MHD) convection phenomena in porous media, which have applications in engineering and applied physics. However, while the topic is timely and potentially impactful, the current submission requires substantial improvements to meet the expected standards of publication in this domain. Major Comments and Recommendations  1. The text suffers from numerous typographical and grammatical errors adversely affecting readability. Examples include:    * Frequent spelling mistakes and inconsistent technical terminology.    * Awkward sentence structures and improper use of scientific terms.   **Recommendation:** A thorough language revision by a native English speaker or professional scientific editor is imperative to bring clarity and polish so that the research can be effectively communicated.   1. The manuscript currently lacks a dedicated and comprehensive nomenclature section, which is critical for readers unfamiliar with all parameters and symbols used (e.g., Darcy-Brinkman number, Alfvén velocity).   **Recommendation:** Adding a clear, well-organized nomenclature list will significantly improve the manuscript’s accessibility and reproducibility.   1. The introductory section is presently sparse and lacks engagement with recent advances and relevant literature in the coupled fields of ferrofluid mechanics, porous media convection, and magnetohydrodynamics with heat sources. For a study at the intersection of fluid dynamics and porous media, grounding in up-to-date research is crucial.   **Recommendation:** Expand the literature review by incorporating references addressing related phenomena such as slip flow conditions, chemical reactions, and heat source impacts in nanofluid and ferrofluid contexts:   * + Mathematical Modelling of Fluid Dynamics and Nanofluids   + Numerical Analysis of the Magnetic Dipole Effect on a Radiative Ferromagnetic Liquid Flowing over a Porous Stretched Sheet   + Slip Effects on Casson Nanofluid over a Stretching Sheet with Activation Energy: RSM Analysis   + The impact of Soret Dufour and radiation on the laminar flow of a rotating liquid past a porous plate via chemical reaction   + Thermal performance of MgO-SWCNT/water hybrid nanofluids in a zigzag walled cavity with differently shaped obstacles   + Thermal and flow dynamics of magnetohydrodynamic Burgers' fluid induced by a stretching cylinder with internal heat generation and absorption   Embedding these references will strengthen the scientific foundation and emphasize the novelty and relevance of the present study.   1. The manuscript employs the Darcy-Brinkman model and perturbation techniques but does not sufficiently reference foundational and contemporary sources for the governing equations or boundary conditions. Moreover, presenting limiting cases (e.g., Darcy limit, Brinkman limit, zero magnetic field) could allow comparison with known results, reinforcing confidence in the analytical approach.   **Recommendation:** Cite seminal works on Darcy-Brinkman porous media flow and ferrofluid convection models, and highlight benchmark cases to verify analytical results.   1. The current results section lacks depth in both qualitative and quantitative discussions. Beyond showing variations of growth rates, the physical interpretation of stabilizing/destabilizing roles of parameters is superficial. Critical issues such as parametric thresholds, bifurcation behavior, and practical implications need elaboration.   **Recommendation:** Enhance the discussion by carefully interpreting the influence of kinematic viscosity, permeability, magnetic field parameters, and heat source intensity on system stability. Compare with analogous findings in existing literature.   1. The manuscript should discuss the assumptions and limitations inherent in the Darcy-Brinkman approach and linear perturbation analysis, especially considering potential nonlinear effects, heterogeneities of porous media, or transient phenomena.   **Recommendation:** Acknowledging these limitations will provide balanced perspective and guide future research directions.   1. A distinct conclusion summarizing key findings, implications, and possible extensions is absent.   **Recommendation:** Add a conclusion section that synthesizes the main results and suggests practical or theoretical significance.   1. The manuscript does not include any validation of the theoretical results through comparison with experimental data, numerical simulations, or limiting analytical solutions.   **Recommendation:** Incorporate a validation section or discuss the feasibility of such verification to enhance manuscript credibility.   1. The reference list seems outdated and incomplete for a study intersecting advanced ferrofluid convection, porous media flows, and magnetic field effects. Updating the bibliography with recent key papers on hybrid nanofluid flows, slip conditions, and thermal processes is necessary.   **Recommendation:** Include newer publications, such as the previously mentioned articles, to situate the work within current scientific discourse and improve manuscript depth. Minor Comments  * Check consistency of units throughout the manuscript. * Clarify symbols when first introduced. * Improve formatting of mathematical expressions for better readability. * Clarify the physical meaning of parameters such as the square of Alfvén velocity.   While the research topic is promising and relevant to magnetohydrodynamics and porous media convection, the manuscript needs significant revision focused on language clarity, methodological rigor, comprehensive literature integration, enhanced results discussion, and explicit novelty declaration. Addressing these comments, especially with the addition of up-to-date references embedded above, will substantially improve the quality and publishability of the work. |  |

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| **PART 2:** | | |
|  | Reviewer’s comment | Author’s comment *(if agreed with the 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?** | *(If yes, Kindly please write down the ethical issues here in detail)*  No |  |

**Reviewer details:**

**F. Mebarek-Oudina, Algeria**