

Review Form 1.7

Journal Name:	Asian Research Journal of Mathematics
Manuscript Number:	Ms_ARJOM_120028
Title of the Manuscript:	Hilbert structure of the Sobolev space $H^1(\Omega)$
Type of the Article	Original Research Article

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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)
<p>Compulsory REVISION comments</p> <ol style="list-style-type: none"> Is the manuscript important for scientific community? (Please write few sentences on this manuscript) Is the title of the article suitable? (If not please suggest an alternative title) Is the abstract of the article comprehensive? Are subsections and structure of the manuscript appropriate? Do you think the manuscript is scientifically correct? Are the references sufficient and recent? If you have suggestion of additional references, please mention in the review form. <p><u>(Apart from above mentioned 6 points, reviewers are free to provide additional suggestions/comments)</u></p>	<ol style="list-style-type: none"> While this manuscript provides a detailed mathematical analysis of the Hilbert structure of the Sobolev space $H^1(\Omega)$, its importance for the scientific community is somewhat limited. It mainly reviews and proves known results rather than presenting novel theoretical developments. However, it could serve as a useful reference for students and researchers seeking a rigorous treatment of this fundamental function space. The title "Hilbert structure of the Sobolev space $H^1(\Omega)$" is suitable and accurately describes the content. An alternative could be "A Rigorous Analysis of the Hilbertian Properties of Sobolev Space $H^1(\Omega)$" to better reflect the paper's focus on mathematical proofs. The abstract is reasonably comprehensive but could be improved by more clearly stating the paper's objectives and main conclusions. The subsections and structure are generally appropriate, following a logical progression. However, the manuscript would benefit from clearer section numbering, more consistent formatting, and better organization of proofs and definitions. The mathematical content appears to be scientifically correct in its core arguments. However, there are some inconsistencies in notation and presentation that should be addressed. A thorough review by an expert in functional analysis is recommended to confirm all details and improve precision. The references are not sufficiently recent, with most dating from before 2015. The manuscript would be significantly strengthened by incorporating more recent research. Add more References. Some suggested additional references include: <ul style="list-style-type: none"> Leoni, G. (2017). A first course in Sobolev spaces. American Mathematical Society. Brezis, H. (2010). Functional analysis, Sobolev spaces and partial differential equations. Springer Science & Business Media. Evans, L. C. (2010). Partial differential equations. American Mathematical Society. 	
<p>Minor REVISION comments</p> <ol style="list-style-type: none"> Is language/English quality of the article suitable for scholarly communications? 	<p>Regarding the language/English quality of the article for scholarly communications: The manuscript's English quality is below the standard typically expected for scholarly publications and requires significant improvement. Here are some specific observations and suggestions:</p> <ol style="list-style-type: none"> Grammatical errors: There are numerous grammatical mistakes throughout the text. These include issues with subject-verb agreement, incorrect use of articles, and improper sentence structures. Awkward phrasing: Many sentences are constructed in a way that is not idiomatic in English, making them difficult to understand. This suggests the text may have been translated from another language or written by a non-native English speaker. Inconsistent terminology: There are instances where mathematical terms are not consistently used, which can lead to confusion. Formatting issues: The formatting of mathematical equations and symbols is inconsistent and sometimes unclear. This needs to be standardized throughout the manuscript. Lack of clarity: Some explanations and proofs are not clearly articulated, which could make it challenging for readers to follow the mathematical arguments. Punctuation errors: There are numerous punctuation mistakes, particularly with commas and periods in mathematical expressions. Typos: Several typographical errors are present, which should be corrected. 	
<p>Optional/General comments</p>	<ol style="list-style-type: none"> Limited scope: The paper focuses solely on the $H^1(\Omega)$ space in two dimensions. Expanding the analysis to higher-order Sobolev spaces or more general domains would increase its relevance and impact. Insufficient discussion: The conclusion is quite brief and doesn't adequately discuss the implications of the results or suggest directions for future research. 	

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PART 2:

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

Reviewer Details:

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