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| Journal Name: | [Asian Journal of Pure and Applied Mathematics](https://www.jofmath.com/index.php/AJPAM) |
| Manuscript Number: | **Ms\_AJPAM\_1981** |
| Title of the Manuscript: | **A Transformative Geometric Framework for Dihedral Groups: The Symmetry Density Index in Three-Dimensional Space** |
| Type of the Article |  |

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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** (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 applications are great and I believe many future papers and research can be done from the great introduction here. Also, the paper provides many new directions of study in theory and experiment, as well as in generalizations to other spaces, dimensions, and groups and their actions. Several examples are stated clearly. Very good introduction and easily understood. More details can be given, and the interesting applications expanded on. Some typos to fix and references to add. Images are nice and properly captioned and referenced.** | SDI predicts electronic symmetry distri-butions, aiding in the computation of molecular orbitals and their degeneracies. In larger systems, such as porphyrin rings, SDI maps point group symmetries to electronic  transitions, facilitating the design of quantum sensors and various other ways to implement it scientifically. |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **The title is well suitable. One could emphasize the applications which are the most interesting part of the paper. Perhaps add ‘…with applications’ or ‘…with applications to…’** | The title is suitable. |
| **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.** | **Very good abstract. Clearly states the mathematics and its applications, and reads well.** | No I don't think any changes in abstract is required. |
| **Is the manuscript scientifically, correct? Please write here.** | This article is scientifically correct and at a suitable amount of mathematical rigour. The applications are clear and of great practical use in diverse areas, and follow from the theory. | The manuscript is scientifically correct having its wide scope in various areas of mathematics. |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.** | The references with (?) in the paper are missing. For example, the references to the applications must be given. | References are being added in the new manuscript. |
| **Is the language/English quality of the article suitable for scholarly communications?** | There are a few typos, some mathematical and some due to font. The English is of sufficient clarity and fluency. More detail in each section can be added, especially with the applications, a paragraph per section perhaps more. | It is written in easy and accessible language. Reader will get benefited by reading the new research article. |
| **Optional/General** comments | **I really like the applications.**  **Publishable with some minor corrections and with more details on each application and references given. Very readable and clear. Di**sc**ussion, abstract, introduction and conclusion great. Images look great too.**  **Provide missing references, expand on the applications, and generalizations to higher dimensions and different groups can produce clarity to future work and motivation. A bit more rigour can be used when defining ‘near convexity’ eg.**  **Fix the typos and missing exponents and fix equations on first page.** | Dihedral group represents the symmetries of a regular n-sided polygon, encompassing both rotations and reflections. It's a finite group, meaning it has a limited number of elements. These elements consist of rotations around the center of the polygon and reflections across lines of symmetry. Dihedral groups are denoted by D₂ₙ, where 'n' is the number of sides of the polygon. |

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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 details)* | No there are no ethical issues. |