Review of: "The Eisenlohr-Farris algorithm for fully transitive polyhedra"

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Potential competing interests: No potential competing interests to declare.

In this paper, an algorithm from Eisenlohr and Farris is used to consctruct an interesting example of a fully transitive polyhedron with apeirogonal faces in $\mathbb{E}^3$.

The algorithm and related theorems are presented while the example is being constructed bit by bit. Most of the new work appears on Section 6, while the previous sections are focused on presenting the method and previous results.

I wish Section 6 had more details, specially when proving that for the given vertex figure, the constructed polyhedron is the only possible fully transitive polyhedron. I also think there should be some closing indicating the nobelty and how this can help in clasifying all fully transitive polyhedra.

There are some minor changes that I also think would improve the article. Here are some of them (a negative line number indicates that the line should be counted from the bottom):

1. The introduction should end with a description of what appears in each section.
2. pg 3, line -6: Define v_1 and v_2 before defining e.
3. pg 3, line -2: If the cited paper proves that the result of this construction is always a polyhedron, it should be explicit here. Otherwise there should be some disclaimer (i.e. “if the result is a polyhedron…”).
4. pg 4, paragraph 2, line 1: I don't understand what the author means by "Euclidean similarity on $\mathcal{C}^3$, as $\mathcal{C}^3$ is not a subset of Euclidean space. Make this more clear.
5. pg 4, paragraph 2, lines 2 and 3: $\mathcal{G}^3$ is *a* set with one element of each class, not *the* set (as it is not unique).
6. pg 4, paragraph 2, lines 5 and 6: $\mathcal{P}$ is compared to the orbit of a face. This are different kinds of objects. I understand what the author means (the polyhedron constructed from this orbit), but the language should be more precise.
7. pg 4, paragraph 3, line 7: there should be more detail in describing Figure 3. Say how to identify the orbits in the Figure.
8. pg 4, paragraph 3, line -3: Instead of saying that $v,v'\in V_i$ say “v and v_i are in the same element of the partition if and only if […]”. Otherwise, it looks like the subscript i has some importance.
9. In Theorem 2, conditions 2 and 3 should start with $\ldots$ for the infinite case, as the sequence is infinite in both ways.

10. Section 6, lines 3 and 4 “with 2”→ “with subscript 2” (or subindex).
11. Proposition 1: How many flag orbits does this example have?