TOWARDS A TOPOLOGICAL PROOF OF THE FOUR COLOR THEOREM V

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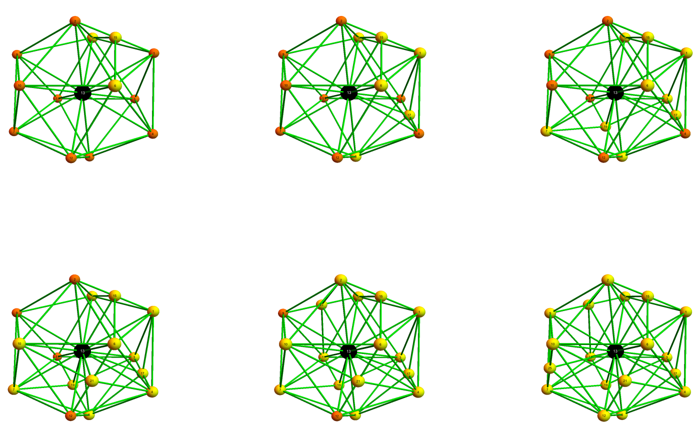
Abstract. Here is an outline of the global proof. See [1, 2].

- Make G cobordant to $\overline{G}$, the completed dual graph.
- Now fill in an interior vertex v_0 and connect to $\overline{G}$. We have now a ball which has G as boundary.
- Clean out $S(v_0)$ to make it Eulerian.
- Take $x_1 \in V(\overline{G})$. Its unit sphere $S(x_1)$ intersects G in a vertex, edge or triangle. Define $U_1 = \{S(x_0)\}$
- Clean out $S(x_1)$ to make it Eulerian. Now take an other vertex x_2 in $S(x_0) \cap S(x_1)$ and define $U = (B(x_0) \cap B(x_1)) \cap S(x_2)$.
- Clean out $S(x_2)$ to make it Eulerian. Continue like this without modifying edges in $S(x_0)$, nor edges in G.
- We have to complete things in such a way that at any time we have only to complete a region.



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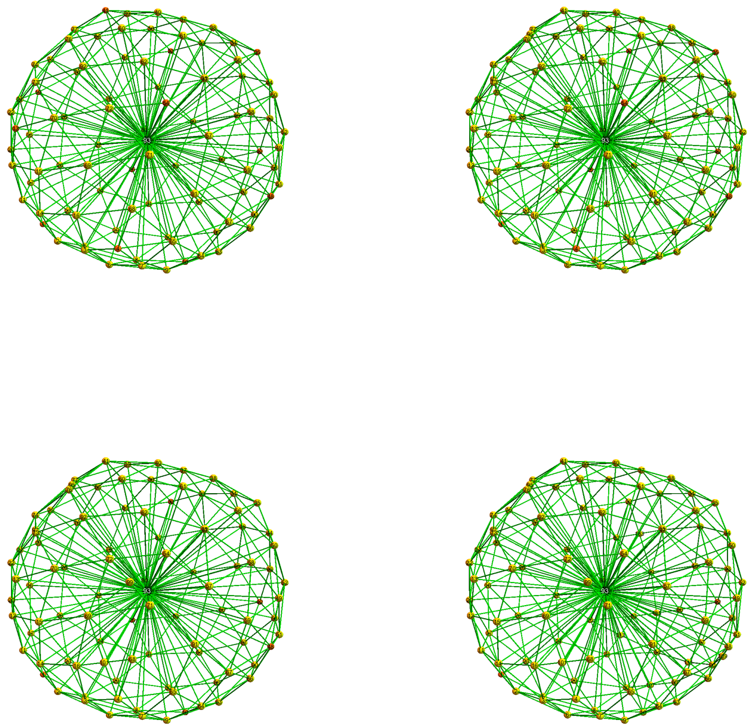
Key words and phrases. Chromatic graph theory, Geometric coloring.



References

[1] O. Knill. Coloring graphs using topology. http://arxiv.org/abs/1410.3173, 2014.
[2] O. Knill. Graphs with eulerian unit spheres. http://arxiv.org/abs/1501.03116, 2015.

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