

A Graph with a Locally Projective Vertex-Transitive Group of Automorphisms $\text{Aut}(Fi_{22})$ Which Has a Nontrivial Stabilizer of a Ball of Radius 2

V. I. Trofimov^{1,2}

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Abstract—Earlier, to confirm that one of the possibilities for the structure of vertex stabilizers of graphs with projective suborbits is realizable, we announced the existence of a connected graph Γ admitting a group of automorphisms G which is isomorphic to $\text{Aut}(Fi_{22})$ and has the following properties. First, the group G acts transitively on the set of vertices of Γ , but intransitively on the set of 3-arcs of Γ . Second, the stabilizer in G of a vertex of Γ induces on the neighborhood of this vertex a group $PSL_3(3)$ in its natural doubly transitive action. Third, the pointwise stabilizer in G of a ball of radius 2 in Γ is nontrivial. In this paper, we construct such a graph Γ with $G = \text{Aut}(\Gamma)$.

Keywords: graph, transitive locally projective group of automorphisms, Fischer group Fi_{22} .

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¹Krasovskii Institute of Mathematics and Mechanics, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, 620108 Russia

²Ural Federal University, Yekaterinburg, 620000 Russia
e-mail: trofimov@imm.uran.ru