Abstract

Alexander Ivanov

Imperial College London

Let G be a subgroup in the automorphism group of a graph X. The action of G on X is said to be weakly locally projective of type $(n(x), q(x))$ if for every vertex x of X the stabilizer $G(x)$ of x in G induces on the set of neighbours of x a permutation group, which contains a normal subgroup isomorphic to the special linear group in dimension $n(x)$ over the field of q(x) elements in its natural doubly transitive action on the set of 1-dimensional subspaces of the $n(x)$-dimensional $GF(q(x))$-space. Every weakly locally projective action is clearly edge-transitive. If it is also vertex-transitive the word `weakly' is to be deleted. The main problem is to bound the order of $G(x)$ by a function of $n(x)$ and $q(x)$. It was proved by D. Goldschmidt in his ground breaking paper of 1980 that $|G(x)|$ is at most 384 if $n(x)=q(x)=2$ for all x; in the vertex-transitive case it amounts to the classical result by *W*. Tuitte of 1947 that $|G(x)|$ is at most 48. For the locally projective actions the problem was attacked by R. Weiss and others before it was completely solved by V. I. Trofimov at the turn of the century. I would like to discuss locally projective subglaphs in weakly locally projective graphs as a possible path towards reducing the problem from weakly to non-weakly projective actions in the case when $q(x)=2$ for some vertex x of X.