On automorphism groups of bi-quasiprimitive 2-arc-transitive graphs

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Let G be a connected (X, 2)-arc-transitive bipartite graph with parts B_0 and B_1 , where $X \leq \operatorname{Aut}(G)$. Let X^+ be the subgroup of X fixing B_0 setwise. In this talk, I will discuss the characterization of the automorphism group of G in case X^+ quasiprimitive on B_0 . We first prove that if X^+ is primitive and faithful on B_0 and B_1 , then $(X^+)^{B_0} \cong (X^+)^{B_1}$ is not of type PA. This is then used to prove that if X^+ is quasiprimitive on B_0 of type HA or TW, then either $\operatorname{soc}(X^+) \cong \operatorname{Aut}(G)$, or $G \cong K_{q,q}$ (q a prime power) or $K_{2^r,2^r} - 2^r K_2 (r \ge 2)$.

This talk is based on [1].

References

 Jin-Xin Zhou, On automorphism groups of bi-quasiprimitive 2-arc-transitive graphs. J. Algebra 620 (2023) 344–362.