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Infinite dimensional linear groups with a large family of G -invariant subspaces

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Abstract: Let F be a field, A be a vector space over F , $\text{GL}(F, A)$ be the group of all automorphisms of the vector space A . A subspace B is called almost G -invariant, if $\dim_F(B/\text{Core}_G(B))$ is finite. In the current article, we begin the study of those subgroups G of $\text{GL}(F, A)$ for which every subspace of A is almost G -invariant. More precisely, we consider the case when G is a periodic group. We prove that in this case A includes a G -invariant subspace B of finite codimension whose subspaces are G -invariant.

Keywords: vector space, linear groups, periodic groups, soluble groups, invariant subspaces

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