

Consequences of the existence of ample generics and automorphism groups of homogeneous metric structures

Maciej Malicki

Warsaw School of Economics, Poland

mamalicki@gmail.com

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We define a criterion for a homogeneous, complete metric structure X that implies that the automorphism group $\text{Aut}(X)$ satisfies all the main consequences of the existence of ample generics: it has the small index property, the automatic continuity property, and uncountable cofinality for non-open subgroups. We verify it for the Urysohn space \mathbb{U} , the Lebesgue probability measure algebra MALG , and the Hilbert space ℓ_2 , thus proving that $\text{Iso}(\mathbb{U})$, $\text{Aut}(\text{MALG})$, $U(\ell_2)$, and $O(\ell_2)$ share these properties. We also formulate a condition for X that implies that every homomorphism of $\text{Aut}(X)$ into a separable group K with a left-invariant, complete metric, is trivial, and we verify it for \mathbb{U} , and ℓ_2 .