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Strong topological transitivity.

Let X be a topological vector space. An operator $T \in L(X)$ is called strongly topologically transitive if $X \setminus \{0\} \subset \bigcup_{n=0}^{\infty} T^n(U)$ for any nonempty open set $U \subset X$. In this extended abstract, we deal with the strong topological transitivity of some well-known topologically transitive operators. It is proved that, on $H(\mathbb{C})$, the derivative operator is strongly topologically transitive but translation operators are not. We present a sufficient condition and a necessary condition for weighted backward shifts on C_0 and ℓ^p to be strongly topologically transitive. We prove that the adjoint of any invertible multiplication operator on H^2 is not strongly topologically transitive but there are non-invertible multiplication operators whose adjoints are strongly topologically transitive. We show that no composition operator on a Banach space X of analytic functions on the disk is strongly topologically transitive. Finally, it is proved that on every second countable Baire locally convex space X, the set of all strongly topologically transitive operators is either empty or SOT-dense in $L(X)$. (Received September 21, 2017)