ON LOMONOSOV'S INVARIANT SUBSPACE THEOREM

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Abstract: A collection $\mathcal{A}$ of operators is said to be *non-transitive* if there exists a non-trivial closed $\mathcal{A}$-invariant subspace. Otherwise, the family $\mathcal{A}$ is called *transitive*. A transitive algebra $\mathcal{A}$ of operators on a real or complex Banach space has the property that for each non-zero compact operator K there exists some $A \in \mathcal{A}$ such that the compact operator AK has a non-zero fixed point. This fundamental result of Lomonosov yields the classical Lomonosov's Invariant Subspace Theorem, which guarantees the existence of a non-trivial closed hyperinvariant subspace for a non-scalar operator on a complex Banach space whose commutant contains a non-zero compact operator. Considering the above-mentioned fixed point theorem from a lattice-theoretic point of view, an extension of Lomonosov's Invariant Subspace Theorem to the super right-commutant of a non-scalar operator on a complex Banach lattice shall be derived. Relevant consequences related to compact-friendly operators will also be discussed.

This is joint work with Mert Çağlar.