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*Linear bijections on von Neumann factors commuting with  $\lambda$ -Aluthge transform.*

We present a characterization of  $*$ -isomorphisms of certain operator algebras in terms of their relation to generalized Aluthge transforms.

We prove that a bijective linear transformation between von Neumann factors which commutes with a  $\lambda$ -Aluthge transform is necessarily a nonzero scalar multiple of an algebra  $*$ -isomorphism in the case of algebras which are not of type  $I_2$ . As for type  $I_2$  factors, i.e., in the particular case of the algebra of 2 by 2 complex matrices, we also present a complete description of those transformations which is a bit different. Namely, nonzero scalar multiples of algebra  $*$ -antiisomorphisms perturbed by the negative of the trace functional times the identity also show up.

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