One-sided invertibility of functional operators in rearrangement-invariant spaces

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Let Γ be a closed Jordan smooth curve and let α be a *diffeomorphism* of Γ onto itself which *preserves* or *changes* the orientation of Γ. Suppose the set Λ of periodic points of α is arbitrary *non-empty* set. This talk is devoted to criteria of one-sided invertibility of the functional operators

$$A = aI - bW,$$

where a and b are continuous functions, I is the identity operator, W is the shift operator:

$$(Wf)(t) = f[\alpha(t)], \quad t \in \Gamma,$$

in *reflexive rearrangement-invariant spaces of fundamental type* $X(\Gamma)$ *with nontrivial Boyd indices.* These spaces generalize classic Lebesgue, Orlicz, and Lorentz spaces. As a corollary, the spectrum of the weighted shift operator gW with continuous coefficient g is calculated. In particular, the spectrum of W in the space $X(\Gamma)$ with distinct Boyd indices is "massive", i.e., it has a non-zero two-dimensional Lebesgue measure.

This talk is based on a joint work with Yu. I. Karlovich.