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**1027.45002****Karlovich, Alexei; Karlovich, Yuri****Compactness of commutators arising in the Fredholm theory of singular integral operators with shifts.** (English)

Samko, Stefan (ed.) et al., Factorization, singular operators and related problems. Proceedings of the conference in honor of Professor Georgii Litvinchuk, Funchal, Madeira, Portugal, January 28-February 1, 2002. Dordrecht: Kluwer Academic Publishers. 111-129 (2003). [ISBN 1-4020-1407-4/hbk]

Summary: The paper is devoted to the compactness of the commutators  $aS_\Gamma - S_\Gamma aI$  and  $W_\alpha S_\Gamma - S_\Gamma W_\alpha$ , where  $S_\Gamma$  is the Cauchy singular integral operator,  $a$  is a bounded measurable function,  $W_\alpha$  is the shift operator given by  $W_\alpha f = f \circ \alpha$ , and  $\alpha$  is a bi-Lipschitz homeomorphism (shift). The cases of the unit circle and the unit interval are considered. We prove that these commutators are compact on rearrangement-invariant spaces with nontrivial Boyd indices if and only if the function  $a$  or, respectively, the derivative of the shift  $\alpha$  has vanishing mean oscillation.

*Keywords* : Fredholm theory; Cauchy singular integral operator; shift operator; commutator; compact operator; rearrangement-invariant space; Boyd indices; interpolation of compactness

*Classification* :

- \*45E05 Integral equations with kernels of Cauchy type
- 47A53 (Semi-)Fredholm operators; index theories
- 47B07 Operators defined by compactness properties
- 47B47 Derivations and linear operators defined by algebraic conditions

Cited in ...