

INEQUALITIES FOR NORMS OF SOME INTEGRAL OPERATORS

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Abstract. Let $(A(a)u)(x) := \int_0^a (1 - xt)^{-1} u(t) dt$, $0 < a < 1$. Properties of the operators $A(a)$ as $a \rightarrow 1$ are studied. It is proved that $A := A(1)$ is a bounded, positive self-adjoint operator in $H = L^2[0, 1]$, $\|A\| \leq \pi$, while $A : C(0, 1) \rightarrow C(0, 1)$ is unbounded.

Mathematics subject classification (1991): 35R30.

Key words and phrases: Integral operators, inequalities, estimates of the norm, Symm's integral equation.

REFERENCES

- [1] HARDY, G., LITTLEWOOD, J., POLYA, G., *Inequalities*, University Press, Cambridge, 1952.
- [2] KANTOROVICH, L., AKILOV, G., *Functional analysis in normed spaces*, Pergamon, New York, 1964.
- [3] KRASNOSELSKII, M., ET AL., *Integral operators in the spaces of summable functions*, (p. 90), Noordhoff, Leyden, 1976.
- [4] SHIVAKUMAR, P., *Diagonally dominant infinite matrices in linear equations*, Util. Math **1** (1972), 235–248.
- [5] WIDDER, D., *An introduction to transform theory*, Academic Press, New York, 1971.
- [6] HALMOS P. AND SUNDER V., *Bounded integral operators on L^2 -spaces*, Springer-Verlag, New York, 1978.