# The symmetry of a spectrum of nuclear operators in subspaces of $L_p$-spaces

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It was proved in the paper [1] that the spectrum of a nuclear operator $A$ acting on a separable Hilbert space is central-symmetric if and only if trace $A^{2n-1} = 0$, $n \in \mathbb{N}$.

We prove:

Theorem. *Let $Y$ be a subspace of a quotient (or a quotient of a subspace) of an $L_p$-space, $1 \leqslant p \leqslant \infty$ and $T \in N_s(Y, Y)$ ($s$-nuclear), where $1/s = 1 + |1/2 - 1/p|$. The spectrum of $T$ is central-symmetric if and only if* trace $A^{2n-1} = 0, n = 1, 2, \ldots$ .

Remark. $T$ is $s$-nuclear, if $T$ admits a representation

$$T = \sum_i \lambda_i y_i' \otimes y_i,$$

where $(\lambda_i) \in l_s$, $(y_i')$ and $(y_i)$ are bounded.

## References

[1] M. I. Zelikin, "A criterion for the symmetry of a spectrum", *Dokl. Akad. Nauk*, **418**:6 (2008), 737–740.