ON A GENERALIZATION OF THE NOTION OF J-NONEXPANSIVE OPERATOR

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We introduce and investigate the family $\mathfrak{M}_\beta (\beta \in R)$ of linear operators acting in Krein space $H = P_+ H \oplus P_- H$. The belonging criterion for arbitrary linear operator is proved. The important property of the family $\mathfrak{M}_\beta$, is established: every operator $A \in \mathfrak{M}_\beta$ is bounded if and only if when operator $P_- A$. is bounded. The problem of applicability of the Potapov-Ginzburg transformation to operators $A \in \mathfrak{M}_\beta$ is solved. At last we prove, that the operators B, we get with the help of such transformation, are either bounded (in case $\beta < 1$), or inherit the above mentioned property of operators $A \in \mathfrak{M}_\beta$ (incase $\beta \geq 1$).