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Topological classification of pairs of linear mappings

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Each matrix pencil $A+\lambda B$ over a field is strictly equivalent to its *regularizing decomposition*; i.e., a direct sum $(I_r+\lambda D)\oplus(M_1+\lambda N_1)\oplus\cdots\oplus(M_t+\lambda N_t)$, in which D is a nonsingular matrix and each $M_i+\lambda N_i$ is a singular indecomposable Kronecker pencil. By [1], $A+\lambda B$ and $A'+\lambda B'$ over $\mathbb{F}=\mathbb{R}$ or $\mathbb{C}$ are *topologically equivalent* (i.e., $A, B:\mathbb{F}^n\to\mathbb{F}^m$ and $A', B':\mathbb{F}^n\to\mathbb{F}^m$ coincide up to homeomorphisms of $\mathbb{F}^n$ and $\mathbb{F}^m$) if and only if their regularizing decompositions coincide up to permutation of summands and replacement of D by D' such that the linear operators $D, D':\mathbb{F}^r\to\mathbb{F}^r$ coincide up to a homeomorphism of $\mathbb{F}^r$.

[1] V. Futorny, T. Rybalkina, V.V. Sergeichuk, *Linear Algebra Appl.* **450**, (2014), p. 121-137.