

On the distance to the set of singular matrix pencils

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We consider matrix pencils, i.e. matrix polynomials of degree one,

$$P(z) = zE - A.$$

We call $P(z)$ *singular*, if $\det(P(z))$ is a zero function. Given a nonsingular pencil we are interested in its distance to the set of singular pencils, usually the Frobenius norm is chosen as the metric. We will view the problem from many perspectives

- numerical analysis,
- μ -synthesis,
- linear algebra,
- analytic geometry.

We will also present recent results involving additional assumptions on the structure of E and A .