

C. Trunk¹ Department of Mathematics, Technische Universität Ilmenau,
Postfach 100565, 98648 Ilmenau, Germany.

Linear subspaces and matrix pencils

We show how linear subspaces of the form

$$\ker [A \ -E] \quad \text{and} \quad \text{ran} \begin{bmatrix} A \\ -E \end{bmatrix}$$

with matrices A, E are related to matrix pencils of the form $\lambda E - A$. This relation can be used to study various spectral properties of pencils like behaviour under rank one perturbations, distance to singularity, etc. Moreover it allows a simple approach to infinite dimensions, i.e., when A and B are bounded or unbounded operators, e.g., invariance of the essential spectrum under perturbations.

In collaboration with T. Berger (Paderborn), H. Gernandt (Cottbus), F. Martinez Peria (La Plata), F. Philipp, H. Winkler (both Ilmenau), and M. Wojtylak (Krakow).

¹carsten.trunk@tu-ilmenau.de