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Carsten Trunk* (carsten.trunk@tu-ilmenau.de), Technische Universität Ilmenau, PF 10 05 65, D-98684 Ilmenau, Germany. *Perturbations of DAEs and Chip Re-design.*

Electrical circuits are often described via differential algebraic equations (DAEs),

$$(Es - A)x = b,$$

where s is a complex number and A, E are square-matrices and E is singular. It is the aim to improve the behaviour of a given chip by adding additional capacities to the electrical circuit. The goal is, e.g., to increase the bandwidth or other properties which are encoded in the transfer function. Adding a capacity corresponds to a rank one perturbation of the matrix E . In the talk we discuss the spectral behaviour of the pencil $Es - A$ under one-dimensional perturbations. In a next step, we generalize the problem and assume now that E and A are linear operators and answer the question which perturbations let the essential spectrum invariant. (Received March 09, 2021)