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Roswitha März: On linear differential-algebraic equations and linearizations

Abstract: On the background of a careful analysis of linear DAEs, linearizations of nonlinear index-2 systems are considered. Finding appropriate function spaces and their topologies allows to apply the standard Implicit Function Theorem again. Both, solvability statements as well as the local convergence of the Newton-Kantorovich method (quasilinearization) result immediately. In particular, this applies also to fully implicit index 1 systems whose leading nullspace is allowed to vary with all its arguments.