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CHARACTERIZATION OF CLASSES OF SINGULAR LINEAR DIFFERENTIAL-ALGEBRAIC EQUATIONS*

PETER KUNKEL† AND VOLKER MEHRMANN‡

Abstract. Linear, possibly over- or underdetermined, differential-algebraic equations are studied that have the same solution behavior as linear differential-algebraic equations with well-defined strangeness index. In particular, three different characterizations are given for differential-algebraic equations, namely by means of solution spaces, canonical forms, and derivative arrays. Two levels of generalization are distinguished, where the more restrictive case contains an additional assumption on the structure of the set of consistent inhomogeneities.

Key words. Singular differential-algebraic equation, Over- and underdetermined system, Solution space, Canonical form, Derivative array.

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†Mathematisches Institut, Universität Leipzig, Augustusplatz 10–11, D-04109 Leipzig, Fed. Rep. Germany (kunkel@mathematik.uni-leipzig.de).

‡ Institut für Mathematik, MA 4-5, Technische Universität Berlin, Straße des 17. Juni 136, D-10623 Berlin, Fed. Rep. Germany, (mehrmann@math.tu-berlin.de). Supported by *Deutsche Forschungsgemeinschaft*, through MATHEON, the DFG Research Center "Mathematics for Key Technologies" in Berlin.