Preface

Differential algebraic equations (DAE) have developed into a highly topical subject of applied mathematics during the last decade. The interest in those equations is immense, indeed. Although there has been a considerable gain in knowledge in recent years, lots of questions still remain unsolved. So, there is not doubt that DAEs will attract the interest of many mathematicians in the future, too.

Condensed representations of important aspects regarding the theory and the numerical treatment of DAEs were published in the monographs of S. L. Campbell (1978, 1980), Ju. E. Boyarincev (1982), E. Griepentrog and R. März (1986), K. E. Brennan, S. L. Campbell and L. R. Petzold (1986) and E. Hairer, Ch. Lubich and M. Roche (1989).
The Seminar Notes presented here provide a completion to these books – with respect to analytical and geometrical investigations, the class of problems treated actually, as well as with respect to the numerical methods developed.
These Seminar Notes originated in a seminar on DAEs which was held at the division of mathematics of the Humboldt–University Berlin in 1989 and 1990. The contributions include new, still unpublished results as well as detailed discussions of the work of other authors.
Although the individual papers presented here can also be considered independently of each other, these Seminar Notes – as a collection – are to represent and to introduce the positions and methods of the East–Berlin DAE group as a whole.

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