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A NOTE ON NUMERICALLY CONSISTENT INITIAL VALUES FOR HIGH INDEX DIFFERENTIAL-ALGEBRAIC EQUATIONS*

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Dedicated to Víctor Pereyra on the occasion of his 70th birthday

Abstract. When differential-algebraic equations of index 3 or higher are solved with backward differentiation formulas, the solution can have gross errors in the first few steps, even if the initial values are equal to the exact solution and even if the stepsize is kept constant. This raises the question of what are *consistent* initial values for the difference equations. Here we study how to change the exact initial values into what we call *numerically consistent* initial values for the implicit Euler method.

Key words. high index differential-algebraic equations, consistent initial values

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