Quadrature-defect-based a-posteriori error estimates for differential-algebraic equations

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A computationally efficient a-posteriori estimator for collocation solutions to linear index-1 DAEs with properly stated leading term is introduced and analyzed. The procedure is based on a modified defect correction principle, extending an established technique from the ODE context to the DAE case. We prove that the resulting error estimate is asymptotically correct and illustrate the method by means of a numerical example.