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Adaptive multilevel methods for time-dependent PD(A)E-constrained optimization with control constraints

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We present an adaptive multilevel generalized SQP-method for optimal control problems governed by nonlinear time-dependent PD(A)Es with control constraints. Starting with a coarse discretization we combine a generalized trust-region SQP method with an implementable adaptive refinement strategy based on error estimators for the PD(A)E, adjoint PD(A)E and a criticality measure. Moreover, we discuss a variant based on goal oriented error estimators. The algorithm supports the use of independent discretization for the state and adjoint PD(A)E. We show numerical results, where our multilevel SQP-method is in particular coupled with the space-time adaptive PDAE solver KARDOS.