A new relative-error inexact ADMM splitting algorithm for convex optimization

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In this work, we propose a new inexact relative error version of the alternating direction of multipliers (ADMM) method to solve convex problems. Our main algorithm is essentially a generalization of an algorithm recently proposed by B. Svaiter. We promote acceleration through inertial effects in the iteration and with a slightly more flexible relative error criterion. Contrary to the majority of existing inexact relative-error versions of ADMM, one of the distinguishing features of both the algorithm proposed by B. Svaiter and the main algorithm proposed in this paper relies on the fact that the first subproblem is supposed to be solved exactly whereas the second one allows for inexact computations. We justify the proposed algorithm's effectiveness through numerical experiments on regression and classification problems.