D. Reem and A. De Pierro, A new convergence analysis and perturbation resilience of some accelerated proximal forward-backward algorithms with errors, *Inverse Problems*, Vol. 33 (**2017**), 044001. https://doi.org/10.1088/1361-6420/33/4/044001.

Abstract

Many problems in science and engineering involve, as part of their solution process, the consideration of a separable function which is the sum of two convex functions, one of them possibly non-smooth. Recently a few works have discussed inexact versions of several accelerated proximal methods aiming at solving this minimization problem. This paper shows that inexact versions of a method of Beck and Teboulle (fast iterative shrinkable tresholding algorithm) preserve, in a Hilbert space setting, the same (non-asymptotic) rate of convergence under some assumptions on the decay rate of the error terms The notion of inexactness discussed here seems to be rather simple, but, interestingly, when comparing to related works, closely related decay rates of the errors terms yield closely related convergence rates. The derivation sheds some light on the somewhat mysterious origin of some parameters which appear in various accelerated methods. A consequence of the analysis is that the accelerated method is perturbation resilient, making it suitable, in principle, for the superiorization methodology. By taking this into account, we re-examine the superiorization methodology and significantly extend its scope.