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J.Y. Bello Cruz* (yunier@ufg.br), Rua 262 #45, Apt. 304, Bl. 2B, Universitário, Goiania, Goias 74615300, Brazil, and **T.T.A. Nghia**. *On the complexity of the proximal gradient iteration for nonsmooth convex minimization problems in Hilbert spaces.*

In this talk we present the convergence and complexity analysis of the iterates in the proximal gradient method with linesearches. When the stepsizes generated by the linesearch are bounded below by a positive number, our analysis shows that the expected error from the cost value at the k -th iteration to the optimal value is $\mathcal{O}(k^{-1})$ in Hilbert spaces and $o(k^{-1})$ in finite dimensions, which improves the complexity of the first-order algorithm presented in the literature. It is worth emphasizing that the global Lipschitz continuity assumption on the gradient of f is sufficient but not necessary for the boundedness from below of the stepsizes aforementioned. Moreover, we show that if the gradient of f is locally Lipschitz the stepsizes generated by the linesearch are bounded below by a positive number. Furthermore, we answer the main question here: "Can we have the complexity $o(k^{-1})$ when $\liminf_{k \rightarrow \infty} \alpha_k = 0$?" with an example. (Received September 21, 2015)