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P. P. B. Eggermont* (eggermon@udel.edu), Food and Resource Economics, University of Delaware, Newark, DE 19711, and **M. Z. Nashed**. *On weakly bounded noise in ill-posed, non-quadratic minimization problems*. Preliminary report.

We study nonlinear ill-posed operator equations with noisy data in Hilbert space. However, rather than assuming that the noise is small in the Hilbert space norm, we assume that the noise is small in the weak sense, and study what happens when the noise converges weakly to 0. This assumption is made quantitative by sending the noise through a certain compact operator and requiring a strong bound on the image.

The nonlinear ill-posed problem is formulated as a non-quadratic minimization problem in Hilbert space, with a Tikhonov-Phillips penalization added. Two typical cases are least-squares for a nonlinear operator equation, and non-quadratic functionals for linear ill-posed operator equations, such as occur in maximum penalized likelihood estimation.

We discuss convergence rates of the regularized minimizers when the non-quadratic minimization problem admits effective quadratic approximations. (Received September 13, 2008)