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M. Zuhair Nashed* (zuhair.nashed@ucf.edu). *Weakly Bounded Noise and Applications to Regularization of Ill-Posed Operator Equations and Moment Discretization.*

The standard view of noise in ill-posed problems is that it is either deterministic and small (strongly bounded noise) or random and large (not necessarily small). A new noise model was recently proposed and investigated by Eggermont et al. (see [1] and [2]), wherein the noise is weakly bounded. Roughly speaking, this means that the "local averages" of the noise are small. In this talk we describe the mathematical setting of this approach and give a precise definition in a Hilbert space setting. We give applications to regularization theory and moment discretization problems such as those that arise in geophysical problems and other inverse problems when the data are available at a discrete set of points. [1] P.P.B. Eggermont, V. N. LaRiccia and M. Z. Nashed, *Inverse Problems*, 25(2009)115018 (14 pages); [2] -, *Noise Models for Ill-Posed Problems*, in "Handbook of Geomathematics" (W. Freeden, M. Z. Nashed and T. Sonar, Eds.), pages 741-762, Springer-Verlag, 2010; [3] -, *Moment discretization for ill-posed problems with discrete weakly bounded noise*, *GEM: International Journal on Geomathematics*, published online: 9 April 2012; vol.3(2012), to appear. (Received September 26, 2012)