Inverse problems under unknown random noise

We deal with the solution of linear ill-posed equations in Hilbert spaces. Often, one only has a corrupted measurement of the right hand side at hand and the Bakushinskii veto tells us that we are not able to solve the equation, if we do not know the noise level.

But in applications it is usually unrealistic to know ad hoc the error of a measurement. In practice, the error of a measurement may often be estimated through averaging of multiple measurements.

We integrated that in our analysis and obtained convergence to the true solution, with the only assumption that the measurements are unbiased, independent and identically distributed according to an elseways arbitrary unknown distribution.