1135-65-546 **Eric Joseph Hall*** (hall@math.umass.edu), Department of Mathematics and Statistics, 710 N. Pleasant Street, Amherst, MA 01003, and **Håkon Hoel**, **Mattias Sandberg**, **Anders Szepessy** and **Raul Tempone**. *Computable error estimates for finite element approximations of elliptic partial differential equations with rough stochastic data.*

The Monte Carlo (and Multi-level Monte Carlo) finite element method can be used to approximate observables of solutions to diffusion equations with lognormal distributed diffusion coefficients, e.g. modeling steady-state groundwater flow. Typical models use lognormal diffusion coefficients with Hölder regularity of order up to 1/2 almost surely. This low regularity implies that the high frequency finite element approximation error (i.e. the error from frequencies larger than the mesh frequency) is not negligible and can be larger than the computable low frequency error. We address how the total error can be estimated by the computable error and propose goal-oriented estimates for the pathwise Galerkin and expected quadrature errors that are derived using easily validated assumptions. (Received September 08, 2017)