

Analysis and Applied Mathematics Seminar

A Bayesian approach to quantifying uncertainty in divergence free flows

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Abstract: We treat a statistical regularization of the ill-posed inverse problem of estimating a divergence free flow field u from the partial and noisy observation of a passive scalar θ which is advected by u . Our solution is a Bayesian posterior distribution, that is a probability measure μ of the space of divergence free flow fields which precisely quantifies uncertainties in u once one specifies models for measurement error and a prior knowledge for u . In this talk we survey some of our recent work which analyzes μ both analytically and numerically. In particular we discuss a posterior contraction (consistency) result as well as some Markov Chain Monte Carlo (MCMC) algorithms which we have developed, refined and rigorously analyzed to effectively sample from μ . This is joint work with Jeff Borggaard, Justin Krometis and Cecilia Mondaini.

Monday, April 26 at 4:00 PM in Zoom