

# History Matching and Gaussian Process Emulation in High Dimensions

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History Matching is a class of algorithms treating inverse problems, often used in industry for calibrating complex models in place of, or in conjunction with, more expensive MCMC methods. For large, PDE-based models, parsimonious algorithms commonly exploit Gaussian process emulation as a method of surrogate modelling. Our work draws upon high-dimensional numerical analysis techniques such as sparse grids to construct efficient emulators, further extending the versatility of History Matching.