
Sparse Collocation Method for Integral Equations with Stochastic Loading

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We develop sparse collocation methods for the second kind integral equations with stochastic loading resulted from PDEs with random boundary conditions. The well-posedness of the discretization scheme is proved. The sparse-grid multi-scale bases are constructed, associated with which a truncation strategy is proposed so that the computational complexity is reduced to be linear up to a logarithmic factor. The convergence rate is not ruined by the truncations.