

Abstract: Despite rank reduction is now a popular way to model spatial processes flexibly and computationally efficiently in geostatistics, its application is extremely limited in spatial econometrics. Given this background, we develop low rank spatial econometric models that are flexible and applicable to large datasets. Our development exploits the property that spatial econometric models have linear mixed effects representations. We introduce a Type II likelihood maximization (empirical Bayesian/h-likelihood method) to estimate these models. Furthermore, we explained how to extend our modeling approach to accommodate such features as spatially varying coefficients, multilevel structures. We compare the performance of our low rank spatial econometrics approach with standard spatial econometric models using simulation experiments.