



## Supersaturated Split-Plot Designs

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In this work, we develop a new general methodology for designing and analysing informative experiments that feature both restricted randomisation and large numbers of factors. The application of such methods offers the potential for economic savings in industrial quality improvement experiments and in the development of new products and processes. We adopt and extend methodology from both the design of split-plot and supersaturated experiments, and propose a Bayesian optimality criterion for design construction. For model selection, we combine ideas from Bayesian inference, REML and shrinkage regression to identify important factorial effects. We study the performance of our approach using various practical examples, and investigate its properties in a simulation study.

**Keywords:** Bayesian optimal design; D-optimality; multi-stratum design; restricted randomisation.