

**Akers, Benjamin; Bohun, Sean; Gibson, Peter; Hofinger, Andreas; Lamoureux, Michael; Lobb, Jason; Mawby, Bill; Roberts, Malcolm**

**General statistical design of an experimental problem for harmonics.** (English) Zbl 1121.62111  
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Introduction: Each year, the Pacific Institute for the Mathematical Sciences organizes a one-week long Industrial Problem Solving Workshop (IPSW), where researchers from academia and industry work for five intense days to make progress on solving specific mathematical problems that arise in real industrial environments. Typically, many new, interesting mathematical results are obtained that provide concrete value to the companies proposing the problems.

Four years ago, the Michelin Tire Corporation proposed a problem on experimental design, to improve the manufacturing process for their tires. The idea is basically to determine the effects of placements for various layers built up in the construction of a tire, to allow the design of a smooth tire with a smooth ride. A highly successful solution was developed, and it has been reported that this method introduced savings of over half a million dollars in their test processes. This year, Michelin returned to the workshop with an extension to the original problem, to address specific refinements in the testing method. This report summarizes the work completed in course of the five day workshop.

**MSC:**

**62P30** Applications of statistics in engineering and industry; control charts

**62K99** Design of statistical experiments

**42A99** Harmonic analysis in one variable

**Keywords:**

Fourier series; good lattice point method; linear models

**Full Text:** [Link](#)