

1086-VI-1068

**Marian Frazier\*** (frazier.149@osu.edu) and **William I. Notz** (win@stat.osu.edu). *Adaptive Design for Non-Stationary Surfaces Using Changes in Slope.*

Computer experiments are used to study physical processes that are too costly, difficult, or dangerous to experiment with in the physical world. Complex computer code that simulates these physical experiments often results in an extremely long running time. Hence, the design points must be chosen carefully and intelligently. An efficient design method that can investigate the response surface in a small number of samples is a must. With this in mind, sequential (adaptive) designs that allow users to focus their attentions on interesting areas of the response are a logical choice.

Historically, computer experiments included an assumption of stationarity, but new modeling methods have been shown to be effective at fitting non-stationary surfaces. We propose a sequential design method that is efficient at investigating non-stationary response surfaces. This method focuses on the search for areas with large changes in slope, with the idea that sudden changes in slope are an indication of non-stationary “breaks” in the response. While seeking out these boundary points, our method still achieves an effective fit of the entire response surface. The merits of this method are exhibited in several examples, including comparisons to existing sequential design methods. (Received September 18, 2012)