

広島統計談話会  
Hiroshima Statistics Study Group

第 285 回談話会を下記のように開催致しますので  
御参集下さいますようご案内申し上げます。

You are cordially invited to the 285<sup>th</sup> meeting as scheduled below.

日 時 : 2014 年 10 月 3 日 (金) 15:00 –  
Date : October 3rd, 2014 (Fri) 15:00 –  
場 所 : 放射線影響研究所 講堂  
Place : RERF Auditorium  
演 者 : リード D. ランデイス (放射線影響研究所 統計部 主任研究員)  
Speaker : Reid D. Landes, Ph.D.  
Senior Scientist  
Department of Statistics, RERF  
演 題 : 「非線形混合効果モデルを含む一つのベイジアン校正」  
Title : “A Bayesian calibration involving nonlinear mixed effects models”

要 約 :  
**Summary:**

In calibration experiments, a measurand,  $x$ , elicits a response,  $y$ , through an assumed function,  $f(x)$ . Statistical calibration methods aim at accurate and precise prediction of  $x$  given a certain  $y$ , while accounting for random effects in  $f(x)$ . The simple case is when  $f(x)$  is linear with one additive error term. Complications arise when either  $f(x)$  is nonlinear or when additional error terms enter  $f(x)$ . Having both a nonlinear  $f(x)$  and multiple error terms compounds the complexity. Here, we take a Bayesian approach to address these sorts of complexities found in an agricultural time-to-weed-removal study. The study used a split-plot experiment conducted at two locations over two years. We fit the resulting data with Bayesian hierarchical models and obtain predictive posterior distributions of  $x$  through Markov chain Monte Carlo simulation. We then compare Bayesian and classical prediction of  $x$  with a small simulation study.