1067-62-1111 **David Papp*** (dpapp@rutcor.rutgers.edu), 640 Bartholomew Rd, Piscataway, NJ 08854.
Optimal designs for rational function regression.

We consider optimal non-sequential designs for a large class of (linear and nonlinear) regression models involving polynomials and rational functions with heteroscedastic noise also given by a polynomial or rational weight function. The proposed method generates a polynomial whose zeros are the support points of the optimal approximate design, and generalizes a number of previously known results of the same flavor. The method is based on a mathematical optimization model that can incorporate various criteria of optimality and can be solved very efficiently by well established numerical optimization methods. In contrast to previous optimization-based methods proposed for similar design problems, it also has theoretical guarantee of its efficiency. After discussing linear models, applications for finding locally optimal designs for nonlinear regression models involving rational functions are presented, then extensions to robust regression designs, and trigonometric regression are shown. As a corollary, an upper bound on the size of the support set of the minimally-supported optimal designs is also found. (Received September 18, 2010)