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Abstract

When the exact unbiasedness condition is relaxed to a near unbiasedness condition, this short communication shows that the best linear near unbiased estimation problem is actually a semi-infinite programming problem. Our recently developed dual parameterization method is applied for solving the problem. Computer numerical simulation results show that the semi-infinite programming approach outperforms the least squares approach.

Keywords—Best linear near unbiased estimations, nonlinear signal models, semi-infinite programming, dual parameterization.

1. Introduction

Many practical system models, such as fuzzy system models [1], excitation system models [2], psychophysical system models [3], induction machine models [4] and electric power system models [5], are required to perform the parameter estimations for further control, calibration and design. As most practical system models are nonlinear, parameter estimations of nonlinear system models play an important role in many different engineering disciplines.