

Comparing the Extended Conjugate Gradient and Embedding Methods to Solve the Regulator Control Problems with Chemical Applications

N. Banihashemi¹, A. Fakharzadeh J²

¹ Science Dept., Azad University of Gachsaran, Gachsaran, Iran. m.banihashemi@gmail.com

² Dept. of Maths, Shiraz University of Technology, Shiraz, Iran. a.fakharzadeh@sutech.ac.ir

The extended conjugate gradient algorithm and embedding process (substituting the feasible set into a measure space) are two emphasized known methods for solving regulator problems. Regarding the importance of these kind of problems in engineering concepts, in this article, after reviewing on the methods, they are compared numerically and analytically. We also express and analyze their applications in calculating the optimal trajectory and control in an interactive mixture tank of chemical reactor problems in which they have not been applied so far. The results are also compared numerically in the given example.

Keywords: regulator problems, extended conjugate gradient method, control operator, embedding method, radon measure, linear programming.