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ABSTRACTS



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D.C. Programming Approach for Solving an Optimization Problem at Ore-Dressing Plant

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ABSTRACT

This investigation was motivated by a real-world optimization problem formulated at the Erdenet Mining Corporation (Mongolia). By solving an identification problem for a chosen design of experiment we developed a nonconvex quadratic model that quite adequately represents the experimental data.

As well-known, any quadratic function can be represented as a difference of two convex functions (d.c). Therefore it is reasonable to apply the Global Search Theory proposed by A.S. Strekalovsky for solving the quadratic problem.

The theory consists of two basic stages: a local search and the procedures of escaping from critical points, which based on global optimality conditions. A search of critical points is accomplished by a special local search method, which idea consists in successive solving linearized problems. These problems turn out to be convex and can be solved by classical convex optimization methods and software packages (e.g. IBM CPLEX, GUROBI, Xpress-MP etc).

Solving an indefinite quadratic program over a box constraints we found values of technological variables that allow us to reached the main purpose of the Erdenet Mining Corporation to maximize copper amount and copper recovery in rougher concentrate.

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Keywords: nonconvex quadratic program, local search, global search, applied problem, design of experiment