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## WORKING PAPER

# Using Resource Scarceness Characteristics to Solve the Multi- Mode Resource-Constrained Project Scheduling Problem

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2009

2009/595

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D/2009/7012/47

# Using Resource Scarceness Characteristics to Solve the Multi-Mode Resource-Constrained Project Scheduling Problem

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## Abstract

In the past decades, resource parameters have been introduced in project scheduling literature to measure the scarceness of resources of a project instance. In this paper, we use these resource scarceness parameters to differentiate in the search process needed to solve the multi-mode resource constrained project scheduling problem, in which multiple execution modes are available for each activity in the project. Therefore, we propose a scatter search algorithm, which is executed with different improvement methods, each tailored to the specific characteristics of different renewable and non-renewable resource scarceness values. Computational results prove the effectiveness of the improvement methods and reveal that the procedure is among the most competitive algorithms in the open literature.