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# ON THE OPTIMAL VALUE FUNCTION OF A TRUST-REGION PROBLEM WITH TWO CONSTRAINTS

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**Abstract**

This paper studies the properties of the optimal value function for a trust-region problem with two constraints. In this problem, a quadratic function is minimized over an intersection of two quadratic constraints. The optimal value function considered is obtained by changing the sizes of the two quadratic constraints. The value of the optimal value function and its first-order partial derivatives are explicitly calculated in all possible scenarios.

**Keywords and phrases:** optimal value function, trust region, optimal solution, generalized inverse, the Moore-Penrose inverse.