Global Optimization without Search

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Abstract. We analyze the role of additional information in the efficient and complete solution of the global optimization problem. We show that even a modest amount of additional information can be used to substantially reduce the complexity of this problem. In particular, the knowledge of the value of the global minimum together with upper bounds on the Lipschitz constants reduce the problem of locating the global minimum to a pure descent problem, with no search involved. This type of information is actually available in noise-free parameter identification problems, where for correctly identified parameters, the objective functional attains its global minimum at zero.

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