Characterizations of ε-duality gap statements for composed optimization problems[*]

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Abstract

In this paper we present different regularity conditions that equivalently characterize ε-duality gap statements for optimization problems consisting of minimizing the sum of a function with the precomposition of a cone-increasing function to a vector function. These regularity conditions are formulated by using epigraphs and ε-subdifferentials. Taking $\varepsilon = 0$ one can rediscover recent results on stable strong and total duality and zero duality gap from the literature. Moreover, we deliver ε-optimality conditions and (ε, η)-saddle point statements for the aforementioned kind of problems, and ε-Farkas statements involving the sum of a function with the precomposition of a cone-increasing function to a vector function.