

# Weak efficiency in multiobjective quasiconvex optimization on the real-line without derivatives <sup>□</sup>

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## Abstract

This paper deals with the problem of existence of weakly efficient solution to quasiconvex vector optimization problems in a finite dimensional setting on the real-line. This consideration is motivated by algorithmic purposes, because it is expected that, like in scalar minimization, one must solve a one-dimensional problem to find the next iterate. We start by recalling a notion of nonconvexity weaker than quasiconvexity for vector functions introduced earlier by one of the author in an previous paper. Afterwards, we characterize the nonemptiness and/ or compactness of the weakly efficient solution set. Then, this set is described as much as possible in the multiobjective case, and the bicriteria problem is carefully analyzed when each component is lower semicontinuous and quasiconvex. Several examples showing the applicability of our results are presented, and various algorithms are stated to compute the overall weakly efficient solution set.

**Key Words.** nonconvex vector optimization, quasiconvex vector functions, weakly efficient solution, asymptotic function, asymptotic cone.

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