

# Semi-quasidifferentiability in quasiconvex nonsmooth optimization

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## Abstract

Semi-quasidifferential notion, as a new tool to deal with nonsmooth optimization problems, is exploited to provide some Karush–Kuhn–Tucker type optimality conditions for quasiconvex programming. We obtain some necessary and sufficient optimality conditions for a constrained nonsmooth quasiconvex optimization problem in terms of semi-quasidifferentials. Moreover, we show that a broad class of functions, including Gâteaux differentiable functions, convex and concave functions, and Clarke’s regular functions, are semi-quasidifferentiable. Regarding this, our outcomes generalize several related results existing in the literature.

## References

- [1] KABGANI A., Characterization of nonsmooth quasiconvex functions and their Greenberg-Pierskalla’s subdifferentials using semi-quasidifferentiability notion, *J. Optim. Theory Appl.* **189**: 666 – 678, 2021.
- [2] KABGANI A. & SOLEIMANI-DAMANEH M., Semi-quasidifferentiability in nonsmooth nonconvex multiobjective optimization, *Eur. J. Oper. Res.* **299**: 35 – 45, 2022.

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