

SUBDIFFERENTIALS AT INFINITY AND APPLICATIONS IN OPTIMIZATION

TIẾN-SON PHẠM

ABSTRACT. In this work, the notions of *normal cones at infinity* to unbounded sets and *limiting and singular subdifferentials at infinity* for extended real value functions are introduced. Various calculus rules for these notions are established. A complete characterization of the Lipschitz continuity at infinity for lower semicontinuous functions is given. The obtained results are aimed ultimately at applications to diverse problems of optimization, such as optimality conditions, weak sharp minima, coercive properties and stability results.

The talk is based on the following papers:

- [1] D. S. Kim, M. T. Nguyen, and T. S. Phạm. *Subdifferentials at infinity and applications in optimization*. Available at <https://arxiv.org/abs/2307.15861>.
- [2] D. S. Kim, M. T. Nguyen, T. S. Phạm, and N. V. Tuyen. *Coderivatives at infinity of set-valued mappings*. Available at <https://arxiv.org/abs/2311.18370>
- [3] M. T. Nguyen and T. S. Phạm. *Clarke's tangent cones, subgradients, optimality conditions and the Lipschitzness at infinity*. SIAM J. Optim., 34(2):1732–1754, 2024.

DEPARTMENT OF MATHEMATICS, DALAT UNIVERSITY, 1 PHU DONG THIEN VUONG, DALAT, VIETNAM

E-mail address: sonpt@dlu.edu.vn