INVERSION THEOREM FOR NONCONVEX MULTIFUNCTIONS

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Abstract. Using the techniques of variational analysis, we extend the inversion theorem of Robinson for convex multifunctions to γ-paraconvex multifunctions, preinvex multifunctions and strongly convex multifunctions, respectively. The results are used to derive upper bounds on the distance from an approximate solution to the solution set.

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REFERENCES

[1] D. BHATIA AND A. MEHRA, *Lagrangian duality for preinvex set-valued functions*, J. Math. Anal Appl., **214** (1997), 599–612.

[2] F. H. CLARKE, *Optimization and Nonsmooth Analysis*, John Wiley & Sons, New York, 1983.

[3] H. HUANG, *Global error bounds with exponents for multifunctions with set constraints*, Communications in Contemporary Mathematics, **12** (2010), 417–435.

[4] A. JOURANI, *Open mapping theorem and inversion theorem for γ-paraconvex multivalued mappings and applications*, Studia Mathematica, **117**, 2 (1996), 123–136.

[5] W. LI AND I. SINGER, *Global error bounds for convex multifunctions and applications*, Math. Oper. Res., **23** (1998), 443–462.

[6] G. H. LIN AND M. FUKUSHIMA, *Some exact penalty results for nonlinear programs and mathematical programs with equilibrium constraints*, J. Optim. Theorey Appl. **118** (2003), 67–80.

[7] S. M. ROBINSON, *Regularity and stability for convex multivalued functions*, Math. Oper. Res., **1** (1976), 130–143.

[8] J. S. PANG, *Error bounds in mathematical programming*, Math. Programming (ser. B), **79** (1997), 299–332.

[9] B. H. SHENG AND S. Y. LIU, *Kuhn Tucker condition and Wolfe duality of preinvex set-valued optimization*, Appl. Math. Mech., **27** (2006), 1655–1664.

[10] S. ROLEWICZ, *on γ-paraconvex multifunctions*, Math. Japon., **24** (1979), 293–300.

[11] C. URSESCU, *Multifunctions with convex closed graph*, Czechoslovak Math. J., **7** (1975), 438–441.

[12] T. WEIR AND B. MOND, *Preinvex functions in multiple-objective optimalization*, J. Math. Anal. Appl., **136** (1988), 29–38.

[13] X. Y. ZHENG, *Error bounds for set inclusion*, Science in China (ser.A), **46** (2003), 750–763.

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