

Facial approach for constructing stationary points for mathematical programs with cone complementarity constraints

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This paper is devoted to the study of stationary points of mathematical programs with cone complementarity constraints, denoted as CM-PCC. To achieve this goal, we first review the different formulations of CM-PCC. We then revisit definitions for Bouligand, Proximal Strong, Regular Strong, Wachsmuth's Strong, Wachsmuth's L-Strong, Mordukhovich, Clarke, and Wachsmuth's Weak stationary points, creating a comprehensive framework for CMPCC. Building upon the fundamental principles of cone faces and their properties, we introduce a novel stationarity condition, termed Facial stationary point, which seems the natural generalization of the original weak stationary condition to this CMPCC setting. We then investigate and explain the hierarchical relationships among stationary points.

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