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On the Bredies-Chenchene-Lorenz-Naldi algorithm

Monotone inclusion problems are central in optimization and variational analysis, often solved using splitting methods featuring resolvents or proximal mappings. In 2022, Bredies, Chenchene, Lorenz, and Naldi introduced an elegant framework that unifies well-known algorithms, including Douglas-Rachford and Chambolle-Pock, with strong convergence results under certain conditions.

In this talk, I will report on joint work with Walaa Moursi, Shambhavi Singh, and Xianfu Wang. We extend the analysis of Bredies et al., providing new strong convergence results for linear relations. For the Chambolle-Pock algorithm, we prove convergence to the projection onto an intersection of linear subspaces. We also discuss algorithms by Ryu and by Malitsky and Tam.