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On the convergence of circumcentered isometry methods

This talk is mainly based on the recent work on circumcentered isometry methods by Bauschke, Wang and Ouyang. The circumcentered isometry method is a generalization of the circumcentered Douglas–Rachford method recently introduced by Behling, Bello Cruz and Santos to accelerate the Douglas–Rachford method.

In this talk, we first present the properness of the circumcenter mapping induced by isometries, which makes the circumcentered isometry method well-defined. Then by the demiclosedness principle for circumcenter mapping, we show weak convergence results for circumcentered isometry methods, which include the Douglas–Rachford method and circumcentered reflection methods as special instances. We also provide sufficient conditions for the linear convergence of circumcentered isometry methods. At last, we display pictures on the performance of four circumcentered reflection methods, Shadow Douglas–Rachford method and method of alternating projections for finding the best approximation to the intersection of linear subspaces.