Circumcentering the Douglas-Rachford method

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Resumo/Abstract:
In this work, we present a scheme for improving the convergence of the classical Douglas-Rachford method (DRM) for finding the closest point in the intersection of pairs of finite dimensional subspaces. The proposed scheme modifies the average reflections using a geometric interpretation by means of the Circumcenter, which yields a solution for the best approximation problem. The modification proposed is faster than DRM, however only a negligible computational work per iteration is needed. The proposed method can be interpreted as a nice geometrical tool which can also be applied to other reflection or projection methods to get better performance, even in more general settings. We report and confirm the expected acceleration with some numerical experiments.