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On the generalized Douglas-Rachford algorithm for feasibility problems

We study the generalized Douglas-Rachford algorithm and its cyclic variants which include many projection-type methods such as the classical Douglas-Rachford algorithm and the alternating projection algorithm. Specifically, we establish several local linear convergence results for the algorithm in solving feasibility problems with finitely many closed possibly nonconvex sets under different assumptions. Our findings not only relax some regularity conditions but also improve existing linear convergence rates. In the presence of convexity, the linear convergence is global.