1043-90-50 **D. Russell Luke*** (rluke@math.udel.edu), Department of Mathematical Sciences, 501 Ewing Hall, University of Delaware, Newark, DE 19716. *Finding Best Approximation Pairs Relative to a Convex and a Prox-regular Set in a Hilbert Space.*

We study the convergence of an iterative projection/reflection algorithm originally proposed for solving what are known as phase retrieval problems in optics. There are two features that frustrate any analysis of iterative methods for solving the phase retrieval problem: nonconvexity and infeasibility. The Relaxed Averaged Alternating Reflections (RAAR) algorithm, was designed primarily to address infeasibility, though our strategy has advantages for nonconvex problems as well. We investigate the asymptotic behavior of the RAAR algorithm for the general problem of finding points that achieve the minimum distance between two closed convex sets in a Hilbert space with empty intersection, and for the problem of finding points that achieve a local minimum distance between one closed convex set and a closed prox-regular set, also possibly nonintersecting. The nonconvex theory includes and expands prior results limited to convex sets with nonempty intersection. To place the RAAR algorithm in context, we develop parallel statements about the standard alternating projections algorithm and gradient descent. All the various algorithms are unified as instances of iterated averaged alternating proximal reflectors applied to a sum of regularized maximal monotone mappings. (Received August 11, 2008)