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Alternating projections on non-tangential manifolds

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We consider sequences $(B_k)_{k=0}^\infty$ of points obtained by projecting back and forth between two manifolds $\M_1$ and $\M_2$, and give conditions guaranteeing that the sequence converge to a limit $B_\infty\in\M_1\cap\M_2$. Our motivation is the study of algorithms based on finding the limit of such sequences, which have proven useful in a number of areas. The intersection is typically a set with desirable properties, but for which there is no efficient method of finding the closest point B_{opt} in $\M_1\cap\M_2$. We prove not only that the sequence of alternating projections converges, but that the limit point is fairly close to B_{opt}, in a manner relative to the distance $\|B_0-B_{opt}\|$, thereby significantly improving earlier results in the field. A concrete example with applications to frequency estimation of signals is also presented.

Subjects:	**Numerical Analysis (math.NA)**
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