

Waveform design is a pivotal component of the fully adaptive radar construct. In this paper, we consider waveform design for radar space time adaptive processing (STAP), accounting for the waveform dependence of the clutter correlation matrix. Due to this dependence, in general, the joint problem of receiver filter optimization and radar waveform design becomes an intractable, nonconvex optimization problem. Nevertheless, it is, however, shown to be individually convex either in the filter or in the waveform variables. We derive constrained versions of a) the alternating minimization algorithm, b) proximal alternating minimization, and c) the constant modulus alternating minimization, which, at each step, iteratively optimizes either the STAP filter or the waveform independently. A fast and slow time model permits waveform design in radar STAP, but the primary bottleneck is the computational complexity of the algorithms.