

Problems

Problem 1. Plot the co- and cross-polarized signatures of a dihedral corner reflector with $a=1$, $b=0.6$. (Note that in the scattering matrix, element (1,1) will be negative.) Repeat the calculations for the same dihedral reflector embedded in a pixel where half of the echo power comes from the reflector and half the power is unpolarized background contributions.

Problem 2. Suppose you want to find the optimum polarization to discriminate between the reflector of Problem 1 and a background signal from a slightly rough surface that scatters according to the Bragg model. The background signal scattering matrix has $a=0.5$, $b=1$.

(a). Plot the polarization ratio signatures for the co-polarized and cross-polarized cases, and find the optimum polarization state for discriminating the two target classes. Which works better?

(b). Repeat (a) for the condition where each scatterer type is embedded in an unpolarized background as in Problem 1 (half scatterer/half unpolarized power).