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%%Joshua Gould - Homework Ch 5 - Intro to Radar Systems


%%For the same radar used in problem 1, what is the volume V
% in cubic meters of a volume clutter resolution cell at
% R = 10 km? Repeat for R = 50 km.

tao = 10e-6; %s
c = 2.997924562e8; %Speed of Light
azbeam = 3; %degrees
elbeam = 3; %degrees
Rgnd1 = 10000; %m
Rgnd2= 50000; %m
V1 = ((pi*(Rgnd1^2)*azbeam*elbeam)/4)*((c*tao)/2)

V2 = ((pi*(Rgnd2^2)*azbeam*elbeam)/4)*((c*tao)/2)
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V1 =

   1.0596e+12


V2 =

   2.6489e+13
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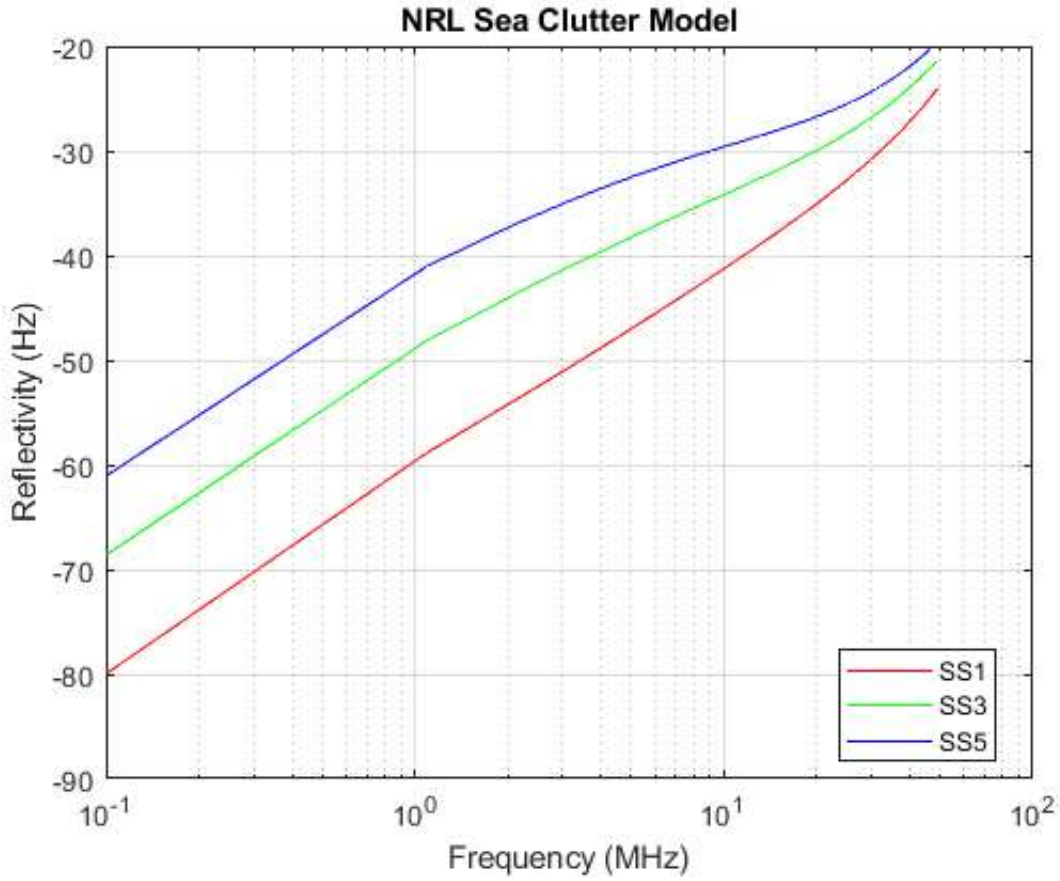
%From the NRL Sea Clutter Model pdf (and feel free to copy the code at the end of the pdf):
 % i.  Code Eq. 7 on page 6
 % ii. Re-create Figure 8 on page 10.
 % In other words, for a 3 GHz radar, vertical polarization,
 % vary the grazing angle from 0.1 degrees to 50 degrees and
 % plot the reflectivity for Sea State 1, Sea State 3, and Sea
 % State 5.
SS = [1 3 5];
x = 0.1:50;
g = 10 * log10 (x);
%grazing angle 0.1 degrees  to 50 in dB scale
% Sea State 1, 3, 5
sign1 = NRL_SigmaSea(3,1,'V',x);
sign3 = NRL_SigmaSea(3,3,'V',x);
sign5 = NRL_SigmaSea(3,5,'V',x);

figure(1);
semilogx(x, sign1, 'r', x, sign3, 'g', x, sign5, 'b')
ylim([-90 -20]);
title('NRL Sea Clutter Model')
legend('SS1','SS3','SS5', 'Location','best')
xlabel('Frequency (MHz)')
ylabel('Reflectivity (Hz)')
grid on;
```



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