
Figure 8.8

Pekeris Waveguide

```
function figure_8_8()

close all;

f_max = 50; %Hz

c1 = 1500; %m/s
c2 = 1800; %m/s
d = 100; %m

for m = 1:3
    % Equation 8.44
    f0m(m) = (m-0.5)*c1*c2/(2*d*sqrt(c2^2-c1^2));
    omega_0m = 2*pi*f0m(m);

    fm = f0m(m):1:f_max;
    omega = 2*pi*fm; %rad/s

    kn = solve_pekeris(fm);

    k_rm{m} = kn(:,m)';

    v = omega ./ k_rm{m};

    f_real{m} = fm;
    v_real{m} = v;

    % Find group velocity u
    u_temp = diff(omega)./diff(k_rm{m});
    u_temp = [0 u_temp]; % shift it over so that the dimensions match
    u_real{m} = u_temp;
end

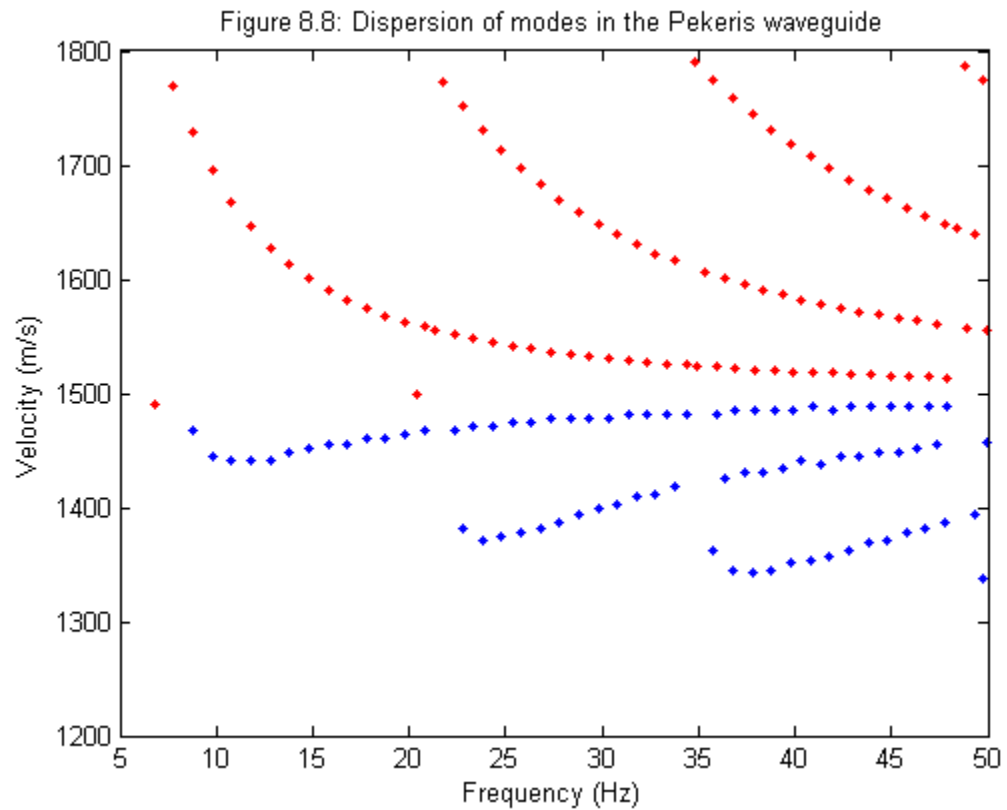
figure();
plot(f_real{1}, u_real{1}, 'b. ');
hold on;
plot(f_real{2}, u_real{2}, 'b. ');
plot(f_real{3}, u_real{3}, 'b. ');

plot(f_real{1}, v_real{1}, 'r. ');
plot(f_real{2}, v_real{2}, 'r. ');
plot(f_real{3}, v_real{3}, 'r. ');

ylim([1200 1800]);
%legend('u1', 'u2', 'u3', 'v1', 'v2', 'v3')
```

```
xlabel('Frequency (Hz)');  
ylabel('Velocity (m/s)');  
title('Figure 8.8: Dispersion of modes in the Pekeris waveguide');  
  
disp('done');  
  
end
```

done



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