
Reproduce Figure 8.7

```
close all;

f = 0:.01:50; %Hz
omega = 2*pi*f; %rad/s
c = 1500; %m/s
d = 100; %m

m = 1:3;

for m = 1:3
    % Equation 8.39
    k_rm(m,:) = sqrt((omega/c).^2 - (m.*pi./d).^2); % rad/m

    v(m, :) = omega ./ k_rm(m,:);
    % Cutoff frequency (real wavenumber only above cutoff)
    f0m(m) = m*c/(2*d);
    f_real{m} = f(f>f0m(m));
    v_real{m} = v(m, (f>f0m(m)));

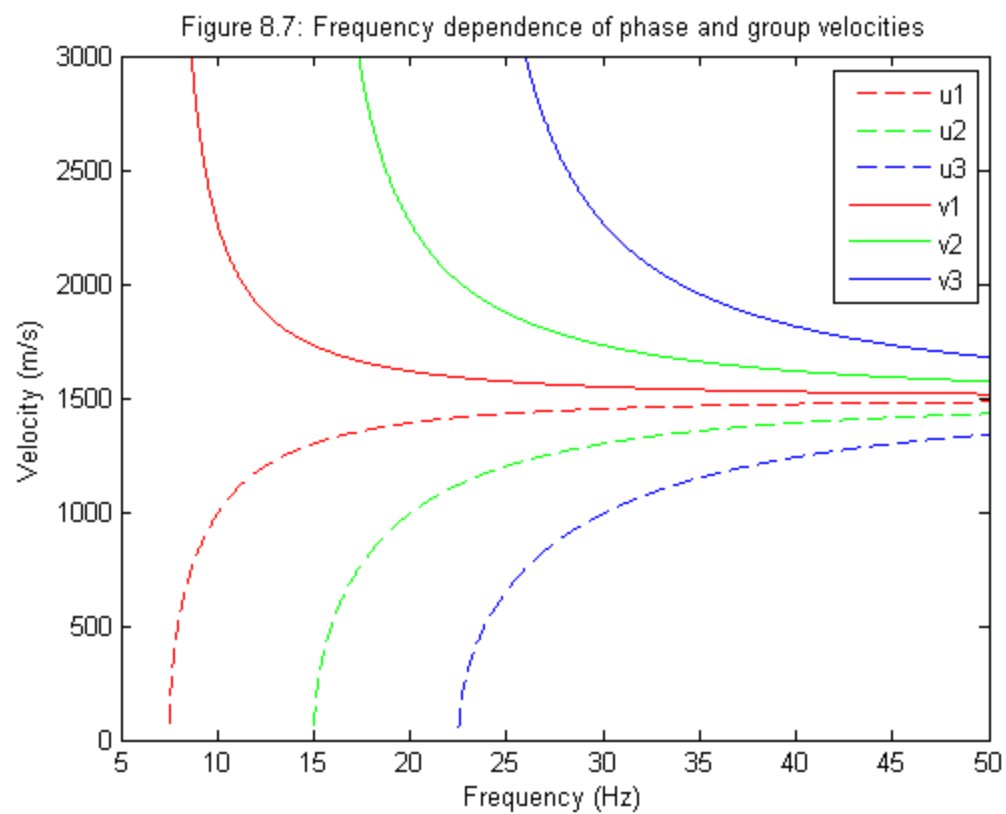
    % Find group velocity u
    u_temp = diff(omega)./diff(k_rm(m,:));
    u_temp = [0 u_temp]; % shift it over so that the dimensions match
    u_real{m} = u_temp(f>f0m(m));
end

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

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

ylim([0 3000]);
legend('u1', 'u2', 'u3', 'v1', 'v2', 'v3')
xlabel('Frequency (Hz)');
ylabel('Velocity (m/s)');
title('Figure 8.7: Frequency dependence of phase and group velocities');
```

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Warning: Imaginary parts of complex X and/or Y arguments ignored
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