% Define parameters

fc = 20;

fs = 10 \* fc;

T = 1 / fs;

t = 0:T:15;

m\_t = t ./ (1 + t .^ 2);

c\_t = cos(2 \* pi \* fc \* t);

% Define sensitivity list

k\_a\_50 = 0.5;

k\_a\_100 = 1.0;

k\_a\_125 = 1.25;

% Define AM signals

s\_t\_50 = (1 + k\_a\_50 \* m\_t) .\* c\_t;

s\_t\_100 = (1 + k\_a\_100 \* m\_t) .\* c\_t;

s\_t\_125 = (1 + k\_a\_125 \* m\_t) .\* c\_t;

% Plot message signal and AM signals

figure

subplot(2, 1, 1)

plot(t, m\_t)

grid

title('Message signal')

xlabel('Time (s)')

ylabel('Amplitude')

subplot(2, 1, 2)

plot(t, s\_t\_50)

grid

title('AM signal: 50% modulation')

xlabel('Time (s)')

ylabel('Amplitude')

figure

subplot(2, 1, 2)

plot(t, s\_t\_100)

grid

title('AM signals: 100% modulation')

xlabel('Time (s)')

ylabel('Amplitude')

figure

subplot(2, 1, 2)

plot(t, s\_t\_125)

grid

title('AM signal: 125% modulation')

xlabel('Time (s)')

ylabel('Amplitude')







