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Matéria: TELC11A - Laboratório de Telecomunicações I

Lab 2: Modulação em Amplitude

Exercício 1 e 2:

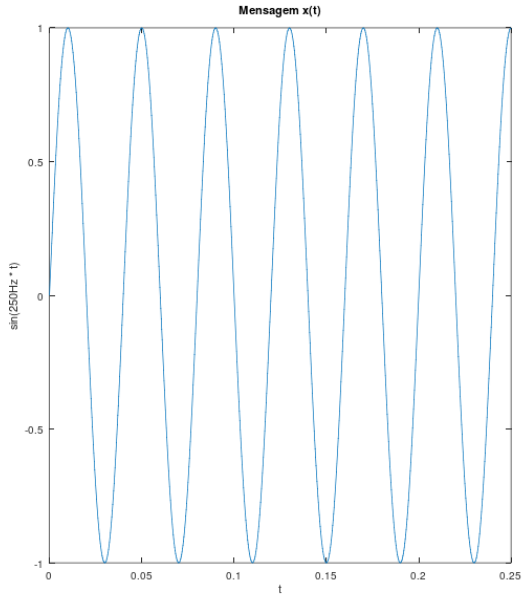
Script utilizado:

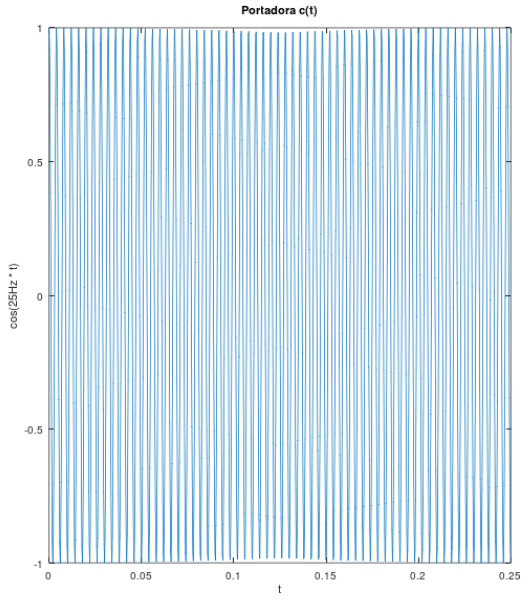
```
clear all;
close all;
clc;

t = linspace(0, 0.25, 1000);

fm = 25;
fc = 250;
A = 1;
xt = sin(2*pi*fm*t);
ct = cos(2*pi*fc*t);


figure;
subplot(1,2,1);
plot(t, xt);
title("Mensagem x(t)");
xlabel("t");
ylabel("sin(250Hz * t)");

subplot(1, 2, 2);
plot(t, ct);
title("Portadora c(t)");
xlabel("t");
ylabel("cos(25Hz * t)");


## SINAL MODULADO COM PORTADORA
m = 1.4;
st = A*(1 + m*xt).*ct;


figure;
subplot(2, 2, 1);
plot(t, st);
title("Sinal Modulado s(t) com portadora");
xlabel("t");
ylabel("s(t)");
```

```
39
40  f = linspace(-fc, fc, 1000);
41  ff = fft(st);
42  ffs = fftshift(ff);
43
44  subplot(2, 2, 2);
45  plot(f, abs(ff));
46  title("Espectro de s(t)");
47  xlabel("t");
48  ylabel("s(t)");
49
50  subplot(2,2,3);
51  plot(f, abs(ffs));
52  title("Espectro de s(t) com shift");
53  xlabel("t");
54  ylabel("s(t)");
55
56  ## SINAL MODULADO SEM PORTADORA
57  st2 = xt.*ct;
58
59  figure;
60  subplot(2, 2, 1);
61  plot(t, st2);
62  title("Sinal Modulado s(t) sem portadora");
63  xlabel("t");
64  ylabel("s(t)");
65
66  f = linspace(-fc, fc, 1000);
67  ff = fft(st2);
68  ffs = fftshift(ff);
69
70
71  subplot(2, 2, 2);
72  plot(f, abs(ff));
73  title("Espectro de s(t)");
74  xlabel("t");
75  ylabel("s(t)");
```

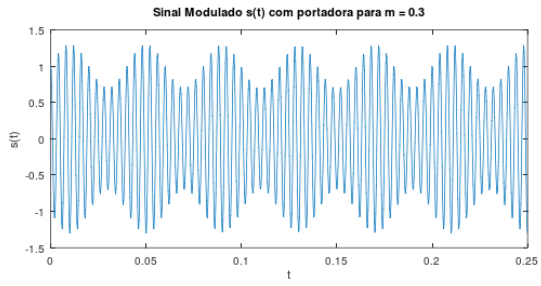
```
76
77  subplot(2,2,3);
78  plot(f, abs(ffs));
79  title("Espectro de s(t) com shift");
80  xlabel("t");
81  ylabel("s(t)");
```

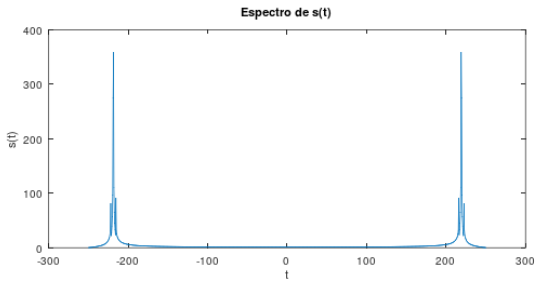
Mensagem e Portadora:

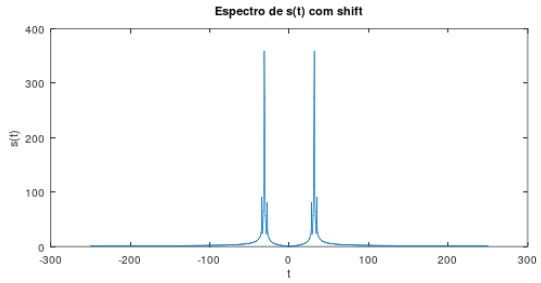




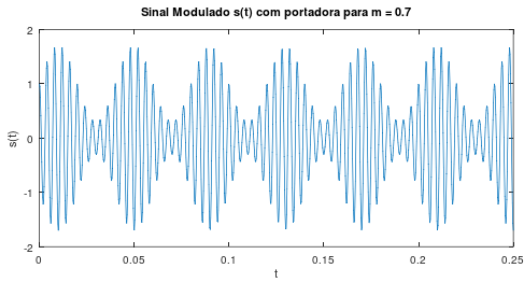
AM-DSB com m = 0.3:

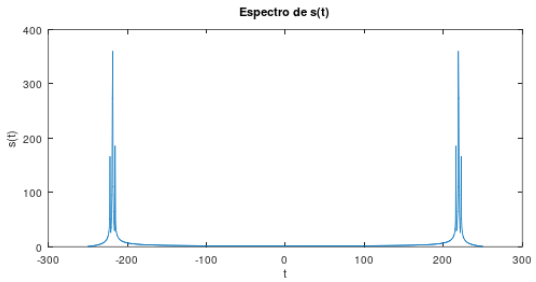


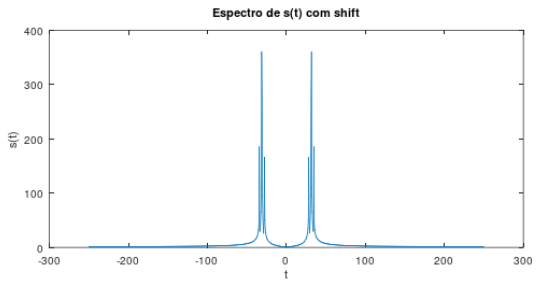




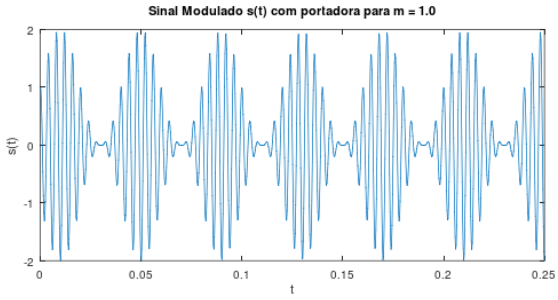
AM-DSB com m = 0.7:

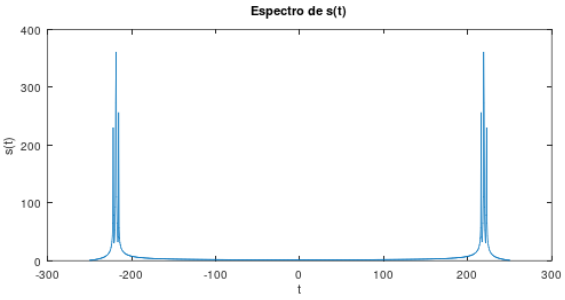


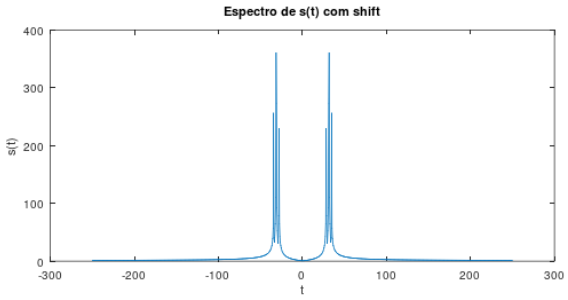




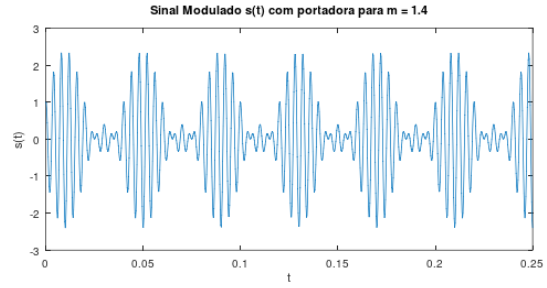
AM-DSB com m = 1.0:

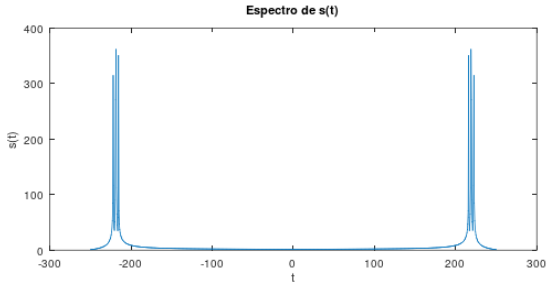


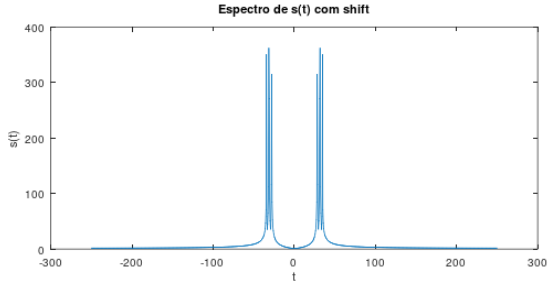




AM-DSB com m = 1.4:

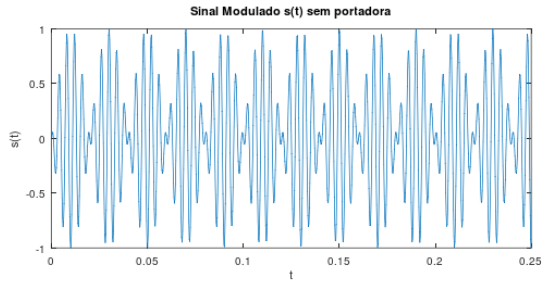


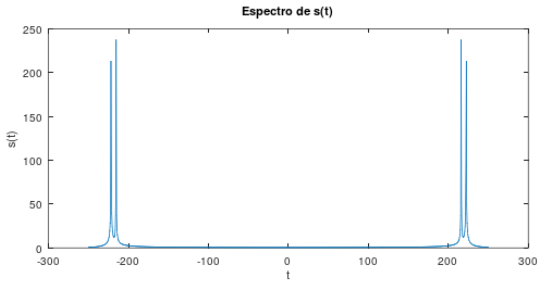


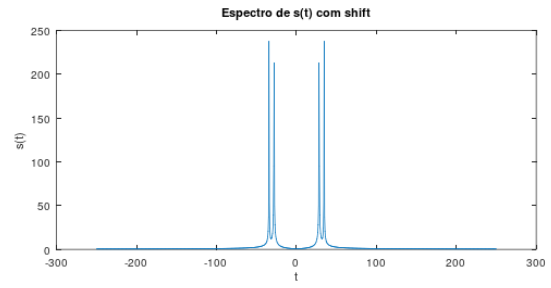


Exercício 3:

AM-DSB-SC:







Discussão:

Conforme visto no espectro do AM-DSB-SC no domínio da frequencia, não há a presença da portadora, e os sinais de banda laterais possuem amplitude de A*1/4 .