load('D:\FOLDER\桌面\校数模\2017B\L-I-20C.mat')

load('D:\FOLDER\桌面\校数模\2017B\S21\_5.mat')

F = f(1101:end)\*1e9;

Hf = S21(1101:end);

P = P/1000;

I = I/1000;

init = [0.7, 1E-5, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

% init = [0.7, 100, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

lambda = 0.327974911948322;

q = 1.6E-19;

Ith0 = 2.09792442194657E-05;

Rth = 3593.49598351965;

a\_0 = 0.00245295354589810;

a\_1 = -2.24461489568760E-05;

a\_2 = 8.55495131262933E-08;

a\_3 = -3.04196846538548E-10;

a\_4 = 6.38679397411974E-13;

T = 293.15 + (I.\*U - P).\*Rth;

Ioff = a\_0 + a\_1.\*T + a\_2.\*T.^2 + a\_3.\*T.^3 + a\_4.\*T.^4;

x = init;

Ns = (P./(x(4).\*x(7)) + x(5).\*x(6).\*P./(x(4) + x(8).\*P))./(x(2)./x(3) + x(5).\*P./(x(4) + x(8).\*P));

test1 = q./x(1).\*(Ns./x(3) + x(5).\*(Ns - x(6)).\*P./(x(4) + x(8).\*P)) + Ith0 + Ioff - I

Ss = ((x(1).\*(I - Ith0 - Ioff)./q) - (Ns./x(3)))./(x(5).\*(Ns - x(6)));

Ps = x(4).\*Ss;

test2 = Ps - P

Ns1 = (1.904172485e-3./(x(4).\*x(7)) + x(5).\*x(6).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3))./(x(2)./x(3) + x(5).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3));

T1 = 293.15 + (7.5e-3.\*2.464597008 - 1.904172485e-3).\*Rth;

Ioff1 = a\_0 + a\_1.\*T1 + a\_2.\*T1.^2 + a\_3.\*T1.^3 + a\_4.\*T1.^4;

Ss1 = ((x(1).\*(7.5e-3 - Ith0 - Ioff1)./q) - (Ns1./x(3)))./(x(5).\*(Ns1 - x(6)));

Ps1 = x(4).\*Ss1;

Y = 1./x(7) + 1./x(3) + x(5).\*Ps1./(x(4) + x(8).\*Ps1) - x(5).\*(Ns1 - x(6))./(1 + x(8).\*Ps1./x(4)).^2; %% 是否平方

Z = 1./(x(7).\*x(3)) + x(5).\*Ps1./(x(7).\*(x(4) + x(8).\*Ps1)) - (1 - x(2)).\*x(5).\*(Ns1 - x(6))./(x(3).\*(1 + x(8).\*Ps1./x(4)).^2); %% 是否平方

% H=Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z);

% M=20\*log10(abs(H));

H=Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z);

M = 20\*log10(abs(H));

test3 = (M-S21)

y2 = sum(test1.^2) + sum(test2.^2) + sum(test3.^2)

1./x(7)+1./x(3)+x(5).\*Ps1./(x(4)+x(8).\*Ps1)-x(5).\*(Ns1-x(6))./(1+x(8).\*Ps1./x(4)).^2

1./(x(7).\*x(3))+x(5).\*Ps1./(x(7).\*(x(4)+x(8).\*Ps1))-(1-x(2)).\*x(5).\*(Ns1-x(6))./(x(3).\*(1+x(8).\*Ps1./x(4)).^2)

test3 = sum(20.\*log(abs(Z./((2i.\*pi.\*f).^2+(2i\*pi\*f)\*C+Z)))-S21)^2

(log((Y-137659035280.771)^2))^2+abs(log(((Z-1.181154286486651e+22)))^2)^2

(((Y-137659035280.771))^4)+(((Z-1.181154286486651e+22)^4\*10^(-40)\*5))

Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z)

H=Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z);

M=20\*log(abs(H))

figure

plot(S21)

figure

x = optimresults.x;

load('D:\FOLDER\桌面\校数模\2017B\L-I-20C.mat')

load('D:\FOLDER\桌面\校数模\2017B\S21\_5.mat')

F = f(1101:end)\*1e9;

Hf = S21(1101:end);

P = P/1000;

P(P==0) = 2.56043051100000e-07;

I = I/1000;

U = U;

% x = target;

init = [0.7, 1E-5, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

% init = [0.7, 100, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

lambda = 0.327974911948322;

q = 1.6E-19;

Ith0 = 2.09792442194657E-05;

Rth = 3593.49598351965;

a\_0 = 0.00245295354589810;

a\_1 = -2.24461489568760E-05;

a\_2 = 8.55495131262933E-08;

a\_3 = -3.04196846538548E-10;

a\_4 = 6.38679397411974E-13;

T = 293.15 + (I.\*U - P).\*Rth;

Ioff = a\_0 + a\_1.\*T + a\_2.\*T.^2 + a\_3.\*T.^3 + a\_4.\*T.^4;

Ns = (P./(x(4).\*x(7)) + x(5).\*x(6).\*P./(x(4) + x(8).\*P))./(x(2)./x(3) + x(5).\*P./(x(4) + x(8).\*P));

test1 = q.\*(Ns./x(3) + x(5).\*(Ns - x(6)).\*P./(x(4) + x(8).\*P))./x(1) + Ith0 + Ioff - I;

test1 = test1;

Ss = ((x(1).\*(I - Ith0 - Ioff)./q) - (Ns./x(3)))./(x(5).\*(Ns - x(6)));

Ps = x(4).\*Ss;

test2 = Ps - P;

test2 = test2./Ps;

Ns1 = (1.904172485e-3./(x(4).\*x(7)) + x(5).\*x(6).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3))./(x(2)./x(3) + x(5).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3));

T1 = 293.15 + (7.5e-3.\*2.464597008 - 1.904172485e-3).\*Rth;

Ioff1 = a\_0 + a\_1.\*T1 + a\_2.\*T1.^2 + a\_3.\*T1.^3 + a\_4.\*T1.^4;

Ss1 = ((x(1).\*(7.5e-3 - Ith0 - Ioff1)./q) - (Ns1./x(3)))./(x(5).\*(Ns1 - x(6)));

Ps1 = x(4).\*Ss1;

Y = 1./x(7) + 1./x(3) + x(5).\*Ps1./(x(4) + x(8).\*Ps1) - x(5).\*(Ns1 - x(6))./(1 + x(8).\*Ps1./x(4)).^2; %% 是否平方

Z = 1./(x(7).\*x(3)) + x(5).\*Ps1./(x(7).\*(x(4) + x(8).\*Ps1)) - (1 - x(2)).\*x(5).\*(Ns1 - x(6))./(x(3).\*(1 + x(8).\*Ps1./x(4)).^2); %% 是否平方

H=Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z);

M=20\*log10(abs(H));

% H=((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z)./Z;

% M = 20\*log10(abs(H));

plot(M)

figure

plot(f, S21, 'oc')

hold on

plot(f, M, 'r--', 'LineWidth',2)

hold off

legend('实测小信号响应', '模型计算小信号响应')

xlabel('f/Hz')

ylabel('H(f)/dB')

saveas(gcf, 'fig15.png');

figure

plot(P)

figure

x = optimresults.x;

load('D:\FOLDER\桌面\校数模\2017B\L-I-20C.mat')

load('D:\FOLDER\桌面\校数模\2017B\S21\_5.mat')

F = f(1101:end)\*1e9;

Hf = S21(1101:end);

P = P/1000;

P(P==0) = 2.56043051100000e-07;

I = I/1000;

U = U;

init = [0.7, 1E-5, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

% init = [0.7, 100, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

lambda = 0.327974911948322;

q = 1.6E-19;

Ith0 = 2.09792442194657E-05;

Rth = 3593.49598351965;

a\_0 = 0.00245295354589810;

a\_1 = -2.24461489568760E-05;

a\_2 = 8.55495131262933E-08;

a\_3 = -3.04196846538548E-10;

a\_4 = 6.38679397411974E-13;

T = 293.15 + (I.\*U - P).\*Rth;

Ioff = a\_0 + a\_1.\*T + a\_2.\*T.^2 + a\_3.\*T.^3 + a\_4.\*T.^4;

Ns = (P./(x(4).\*x(7)) + x(5).\*x(6).\*P./(x(4) + x(8).\*P))./(x(2)./x(3) + x(5).\*P./(x(4) + x(8).\*P));

test1 = q.\*(Ns./x(3) + x(5).\*(Ns - x(6)).\*P./(x(4) + x(8).\*P))./x(1) + Ith0 + Ioff - I;

test1 = test1;

Ss = ((x(1).\*(I - Ith0 - Ioff)./q) - (Ns./x(3)))./(x(5).\*(Ns - x(6)));

Ps = x(4).\*Ss;

plot(Ps)

figure

plot(I, P, 'c')

figure

plot(I, P, 'oc')

hold on

plot(I, Ps, 'r--', 'LineWidth',2)

hold off

legend('实测小信号功率', '模型计算小信号功率')

xlabel('I/A')

ylabel('P/W')

saveas(gcf, 'fig15\_1.png');

figure

plot(I)

figure

x = optimresults.x;

Ns = (P./(x(4).\*x(7)) + x(5).\*x(6).\*P./(x(4) + x(8).\*P))./(x(2)./x(3) + x(5).\*P./(x(4) + x(8).\*P));

t1 = q.\*(Ns./x(3) + x(5).\*(Ns - x(6)).\*P./(x(4) + x(8).\*P))./x(1) + Ith0 + Ioff;

plot(t1)

figure

plot(P, I, 'oc')

hold on

plot(P, t1, 'r--', 'LineWidth',2)

hold off

legend('实测小信号电流', '模型计算小信号电流')

xlabel('P/W')

ylabel('I/A')

saveas(gcf, 'fig15\_2.png');

load('D:\FOLDER\桌面\校数模\2017B\L-I-20C.mat')

load('D:\FOLDER\桌面\校数模\2017B\S21\_5.mat')

F = f(1101:end)\*1e9;

Hf = S21(1101:end);

P = P/1000;

P(P==0) = 2.56043051100000e-07;

I = I/1000;

U = U;

init = [0.7, 1E-5, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

% init = [0.7, 100, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

lambda = 0.327974911948322;

q = 1.6E-19;

Ith0 = 2.09792442194657E-05;

Rth = 3593.49598351965;

a\_0 = 0.00245295354589810;

a\_1 = -2.24461489568760E-05;

a\_2 = 8.55495131262933E-08;

a\_3 = -3.04196846538548E-10;

a\_4 = 6.38679397411974E-13;

T = 293.15 + (I.\*U - P).\*Rth;

Ioff = a\_0 + a\_1.\*T + a\_2.\*T.^2 + a\_3.\*T.^3 + a\_4.\*T.^4;

Ns = (P./(x(4).\*x(7)) + x(5).\*x(6).\*P./(x(4) + x(8).\*P))./(x(2)./x(3) + x(5).\*P./(x(4) + x(8).\*P));

test1 = q.\*(Ns./x(3) + x(5).\*(Ns - x(6)).\*P./(x(4) + x(8).\*P))./x(1) + Ith0 + Ioff - I;

test1 = test1.\*4;

Ss = ((x(1).\*(I - Ith0 - Ioff)./q) - (Ns./x(3)))./(x(5).\*(Ns - x(6)));

Ps = x(4).\*Ss;

test2 = Ps - P;

test2 = test2.\*10;

Ns1 = (1.904172485e-3./(x(4).\*x(7)) + x(5).\*x(6).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3))./(x(2)./x(3) + x(5).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3));

T1 = 293.15 + (7.5e-3.\*2.464597008 - 1.904172485e-3).\*Rth;

Ioff1 = a\_0 + a\_1.\*T1 + a\_2.\*T1.^2 + a\_3.\*T1.^3 + a\_4.\*T1.^4;

Ss1 = ((x(1).\*(7.5e-3 - Ith0 - Ioff1)./q) - (Ns1./x(3)))./(x(5).\*(Ns1 - x(6)));

Ps1 = x(4).\*Ss1;

Y = 1./x(7) + 1./x(3) + x(5).\*Ps1./(x(4) + x(8).\*Ps1) - x(5).\*(Ns1 - x(6))./(1 + x(8).\*Ps1./x(4)).^2; %% 是否平方

Z = 1./(x(7).\*x(3)) + x(5).\*Ps1./(x(7).\*(x(4) + x(8).\*Ps1)) - (1 - x(2)).\*x(5).\*(Ns1 - x(6))./(x(3).\*(1 + x(8).\*Ps1./x(4)).^2); %% 是否平方

% H=Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z);

% M=20\*log10(abs(H));

H=((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z)./Z;

M = 20\*log10(abs(H));

test3 = (M-S21)./10;

y2 = sum(test1.^2)+sum(test2.^2)+sum(test3.^2);

load('D:\FOLDER\桌面\校数模\2017B\L-I-20C.mat')

load('D:\FOLDER\桌面\校数模\2017B\S21\_5.mat')

F = f(1101:end)\*1e9;

Hf = S21(1101:end);

P = P/1000;

P(P==0) = 2.56043051100000e-07;

I = I/1000;

U = U;

init = [0.7, 1E-5, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

x = init;

% init = [0.7, 100, 9.6E-9, 1.5E-8, 1.8E6, 4.97E5, 3.8E-12, 4.7E-8];

lambda = 0.327974911948322;

q = 1.6E-19;

Ith0 = 2.09792442194657E-05;

Rth = 3593.49598351965;

a\_0 = 0.00245295354589810;

a\_1 = -2.24461489568760E-05;

a\_2 = 8.55495131262933E-08;

a\_3 = -3.04196846538548E-10;

a\_4 = 6.38679397411974E-13;

T = 293.15 + (I.\*U - P).\*Rth;

Ioff = a\_0 + a\_1.\*T + a\_2.\*T.^2 + a\_3.\*T.^3 + a\_4.\*T.^4;

Ns = (P./(x(4).\*x(7)) + x(5).\*x(6).\*P./(x(4) + x(8).\*P))./(x(2)./x(3) + x(5).\*P./(x(4) + x(8).\*P));

test1 = q.\*(Ns./x(3) + x(5).\*(Ns - x(6)).\*P./(x(4) + x(8).\*P))./x(1) + Ith0 + Ioff - I;

test1 = test1;

Ss = ((x(1).\*(I - Ith0 - Ioff)./q) - (Ns./x(3)))./(x(5).\*(Ns - x(6)));

Ps = x(4).\*Ss;

test2 = Ps - P;

test2 = test2./Ps;

Ns1 = (1.904172485e-3./(x(4).\*x(7)) + x(5).\*x(6).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3))./(x(2)./x(3) + x(5).\*1.904172485e-3./(x(4) + x(8).\*1.904172485e-3));

T1 = 293.15 + (7.5e-3.\*2.464597008 - 1.904172485e-3).\*Rth;

Ioff1 = a\_0 + a\_1.\*T1 + a\_2.\*T1.^2 + a\_3.\*T1.^3 + a\_4.\*T1.^4;

Ss1 = ((x(1).\*(7.5e-3 - Ith0 - Ioff1)./q) - (Ns1./x(3)))./(x(5).\*(Ns1 - x(6)));

Ps1 = x(4).\*Ss1;

Y = 1./x(7) + 1./x(3) + x(5).\*Ps1./(x(4) + x(8).\*Ps1) - x(5).\*(Ns1 - x(6))./(1 + x(8).\*Ps1./x(4)).^2; %% 是否平方

Z = 1./(x(7).\*x(3)) + x(5).\*Ps1./(x(7).\*(x(4) + x(8).\*Ps1)) - (1 - x(2)).\*x(5).\*(Ns1 - x(6))./(x(3).\*(1 + x(8).\*Ps1./x(4)).^2); %% 是否平方

% H=Z./((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z);

% M=20\*log10(abs(H));

H=((2i\*pi\*f).^2+(2i\*pi\*f)\*Y+Z)./Z;

M = 20\*log10(abs(H));

test3 = (M-S21)./M;

y2 = sum(test1.^2)+sum(test2.^2)+sum(test3.^2);

fitness\_5(x)

target = [0.229535843579394 9.74930547730389e-06 1.35657742521920e-08 1.97291378335878e-08 1398983.42729603 87066.3421503811 1.16078659387274e-11 6.62869006156715e-09];