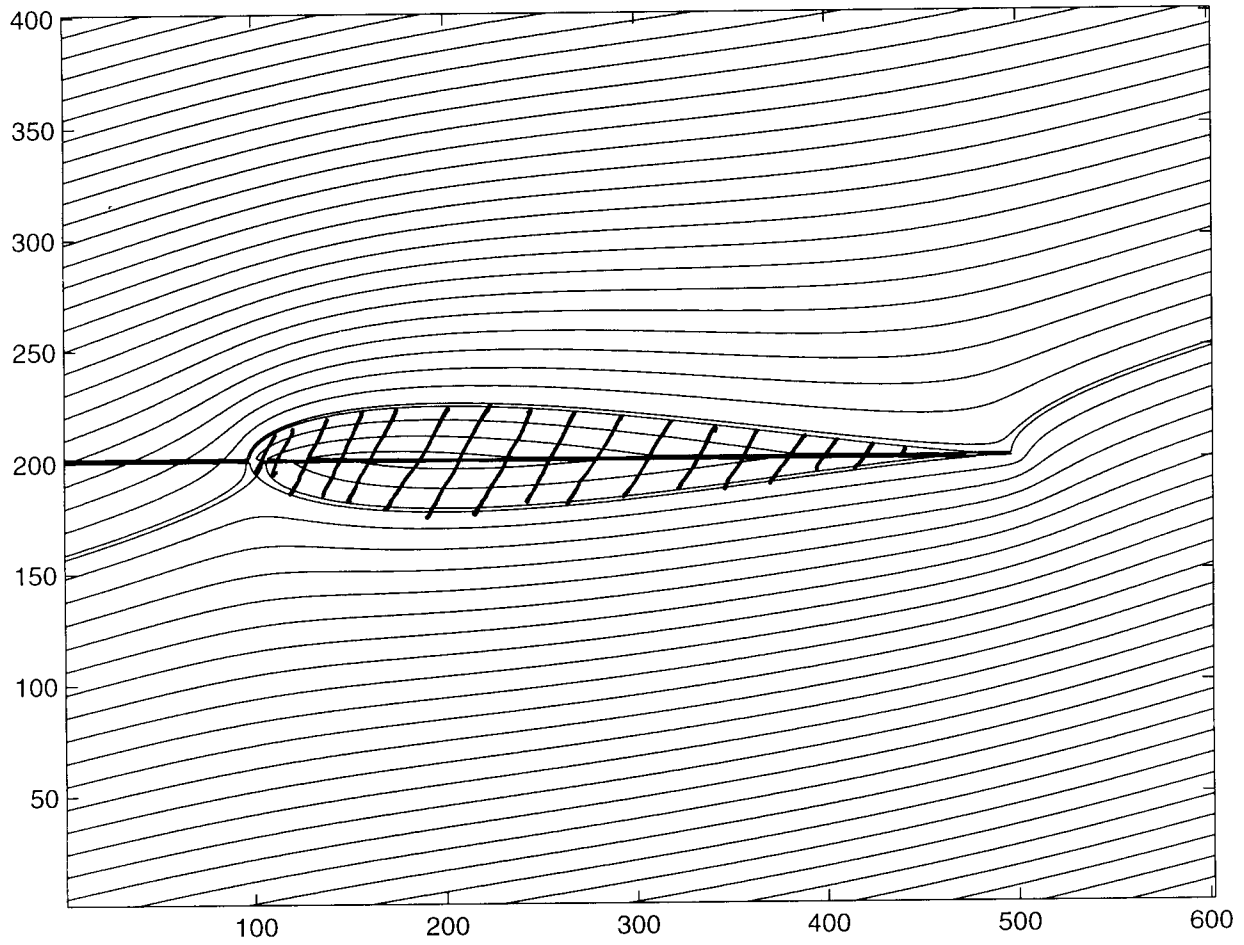


```

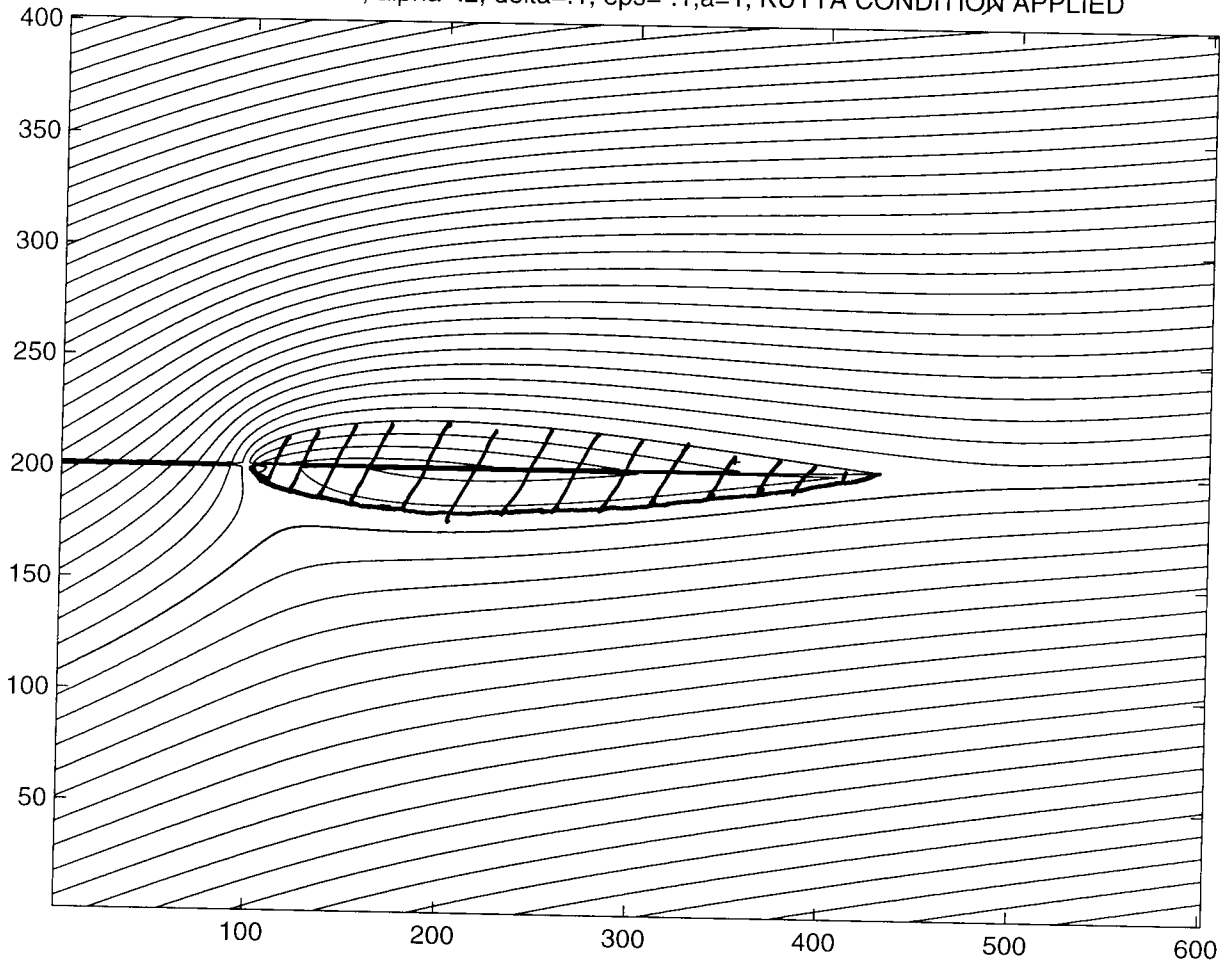
th=0:.01:2*pi;
global eps
x=eps+(1-eps).*cos(th)+(eps+(-eps+1).*cos(th))./(eps^2+2*eps.*(1-eps).*cos(th)+(1-eps)^2);
y=(1-eps).*sin(th)-((-eps+1).*sin(th))./(eps^2+2*eps.*(1-eps).*cos(th)+(1-eps)^2);
plot(x,y)

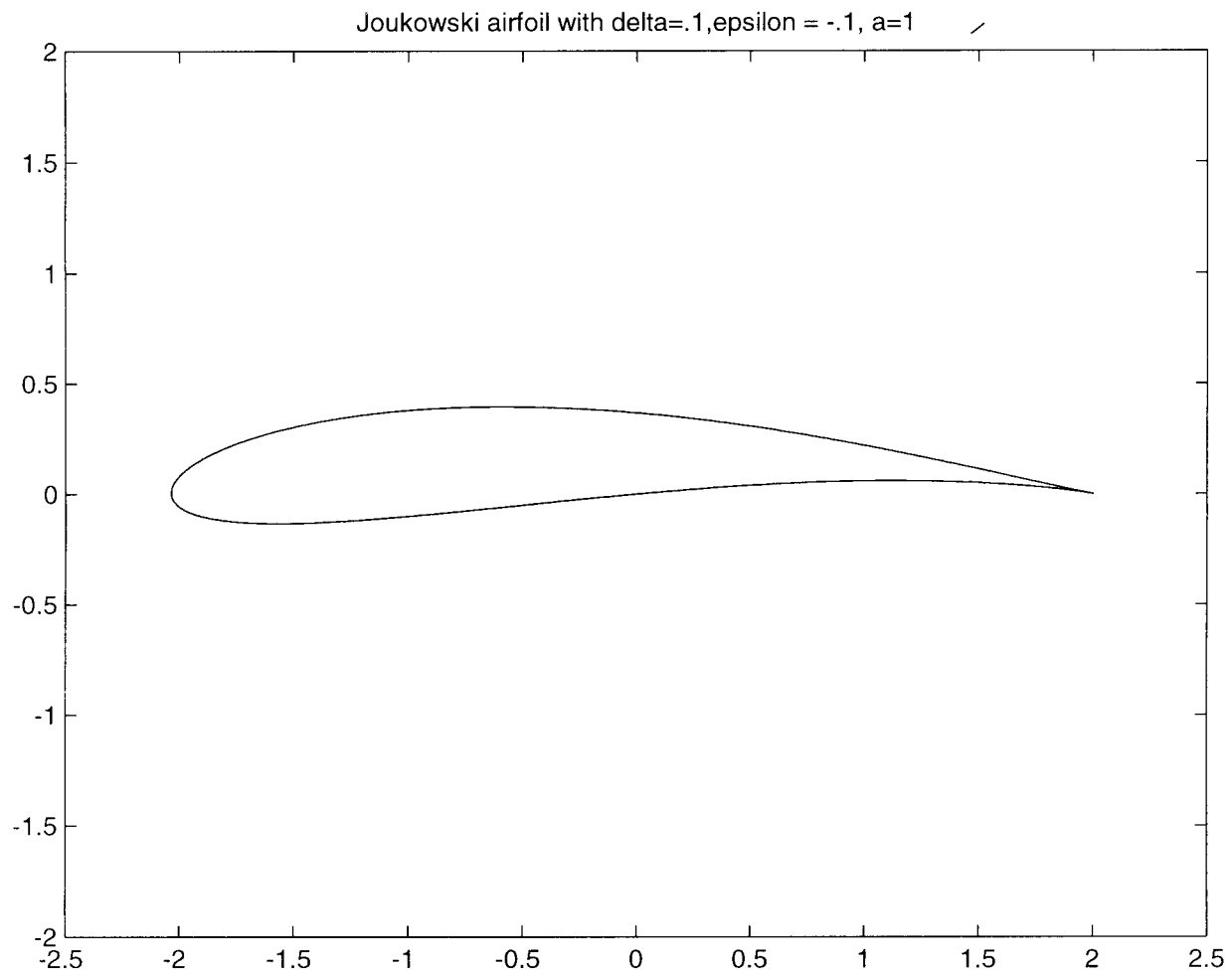
```

Joukowski airfoil in unifrom flow at alpha=.2, delta=0, epsilon=-.1, a = 1, NO CIRCULATION



Joukowski airfoil,  $\alpha=.2$ ,  $\delta=.1$ ,  $\epsilon=-.1$ ,  $a=1$ , KUTTA CONDITION APPLIED



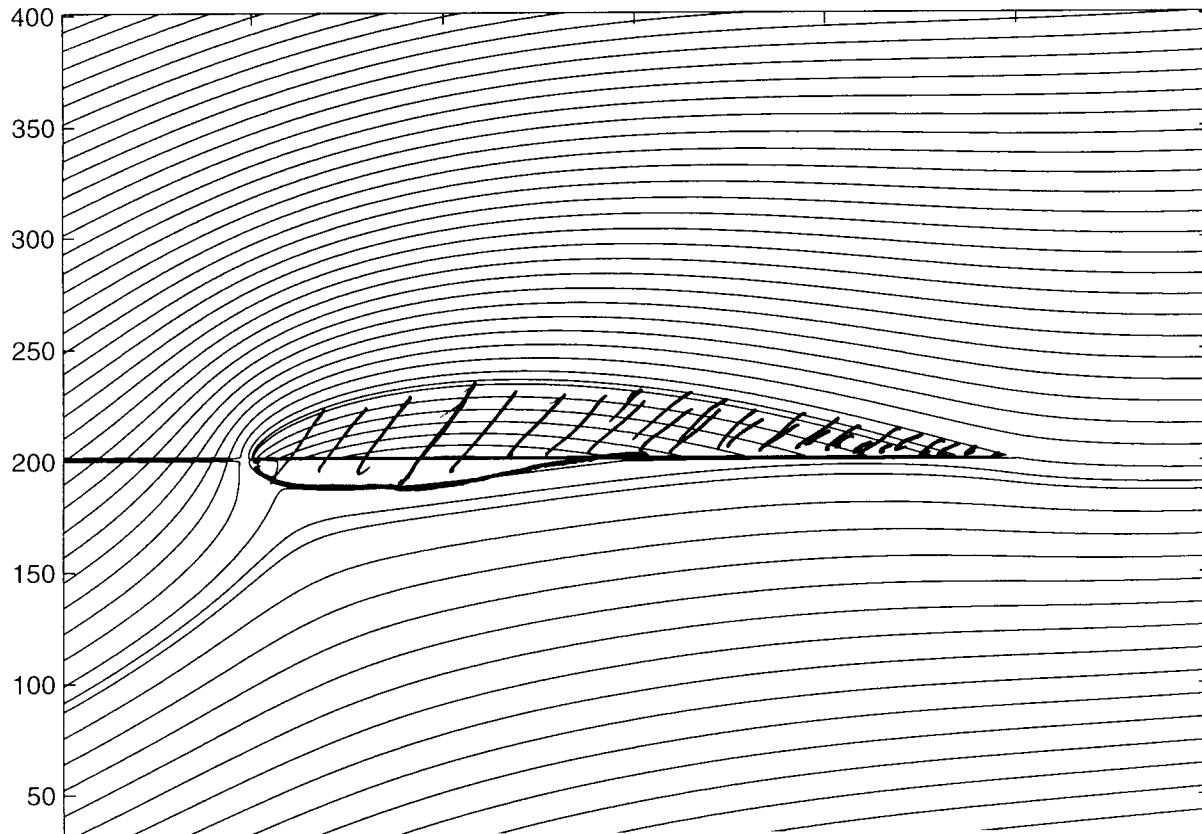


```

global eps del a
th=0:.01:2*pi;
c=eps+i*del;
x=real(c+abs(a-c).*exp(i.*th)+a^2./(c+abs(a-c).*exp(i.*th)));
y=imag(c+abs(a-c).*exp(i.*th)+a^2./(c+abs(a-c).*exp(i.*th)));
plot(x,y)

```

Joukowski airfoil, alpha=.2, delta=.1, eps=-.1,a=1, KUTTA CONDITION APPLIED



```

global eps del alph
c=eps+i*del;
%a=1, U=1
x=-3.005:.01:3.005;
y=-2:.01:2;
[X,Y]=meshgrid(x,y);
r1=sqrt((X-2).^2+Y.^2);
r2=sqrt((X+2).^2+Y.^2);
th1=.5*pi.*(1-sign(X-2)).*sign(Y)+atan(Y./(X-2));
th2=.5*pi.*(1-sign(X+2)).*sign(Y)+atan(Y./(X+2));
zeta= .25.*(sqrt(r1).*exp(i.*th1./2)+sqrt(r2).*exp(i.*th2./2)).^2;
beta=atan(del);
Gam=-4*pi*sqrt((1-eps)^2+del^2)*sin(alph+beta);
w=(zeta-c).*exp(-i*alph)+((1-eps)^2+del^2)*exp(i*alph)./(zeta-c)-i*Gam.*log(zeta-c)./(2
*pi);
Z=imag(w);
v=0:.1 :2;
contour(Z,[0 0])
hold on
contour(Z,50)
hold off
    
```