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N = 300;
gamma = @(t) [cos(t) + 0.65.*cos(2.*t) - 0.65;
    sin(t)]; %parametrization
gammadot = @(t) [-sin(t)-1.3.*sin(2.*t); cos(t)];
gammadotdot = @(t) [-cos(t)-2.6.*cos(2.*t); -sin(t)];

%1 Discretization
ts = linspace(0,2.*pi-2.*pi/N,N);

%2 construct D
D = zeros(N,N);
for i=1:N
    for j=1:N
        a = gammadotdot(ts(j));
        b = gammadot(ts(j));
        b = [-b(2) b(1)];
        vy = -dot(a,b)./dot(b,b).*b;
        if i==j
            D(i,i) = (vy*gamma(ts(i)))./(2.*N.*norm(gammadot(ts)));
        end
        if i~=j
            D(i,j) = vy*((gamma(ts(j))-gamma(ts(i)))./
(norm(gamma(ts(i))-gamma(ts(j))).^2)).*norm(gammadot(ts))./N;
        end
    end
end

%3 construct f
f = cos(cos(ts) + 0.65.*cos(2.*ts) - 0.65).*cosh(sin(ts));

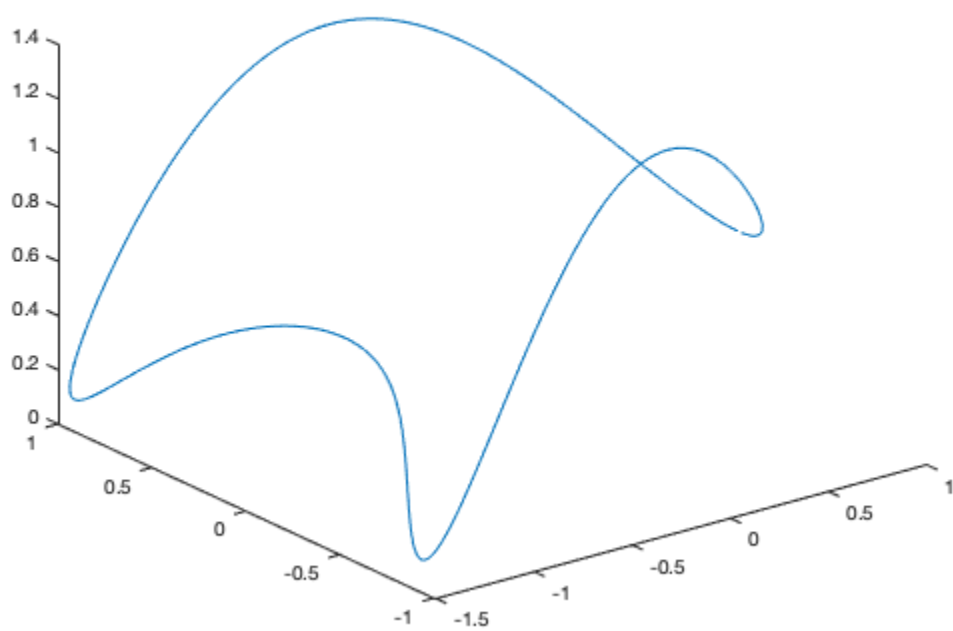
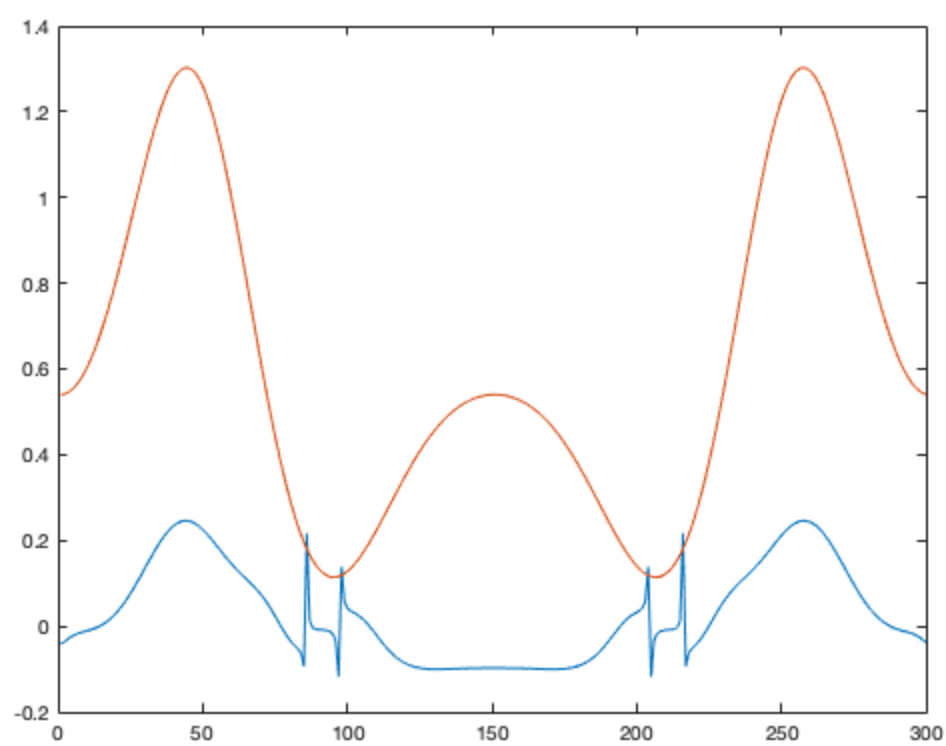
%4 solve for phi
phi = (eye(N)+2.*D)\f';

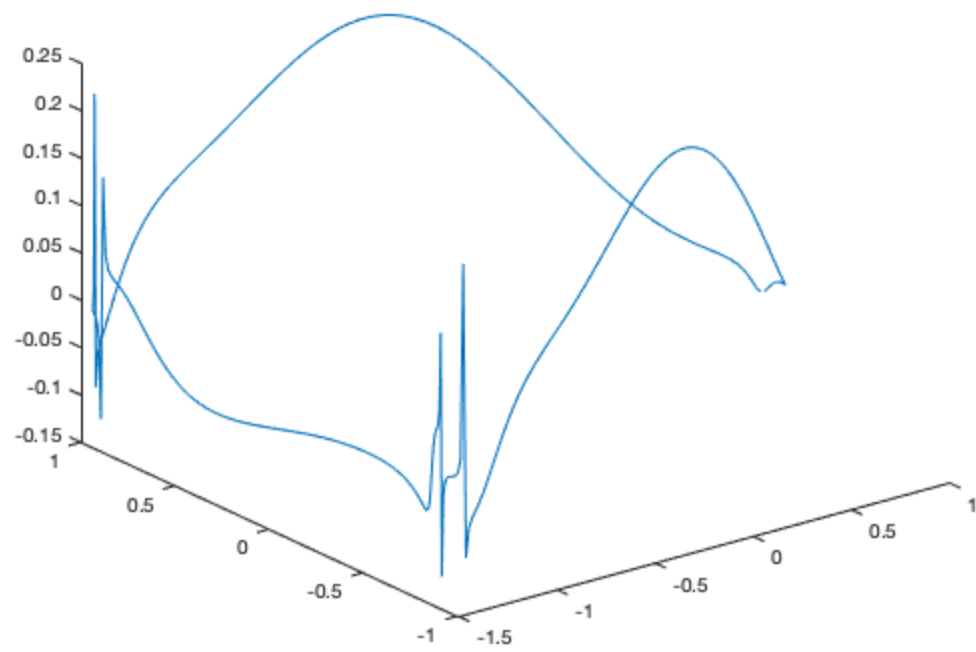
%5 plot results
figure
plot(phi')
hold on;
plot(f)

xs = gamma(ts);
figure
plot3(xs(1,:),xs(2,:),f)
figure
plot3(xs(1,:),xs(2,:),phi')

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