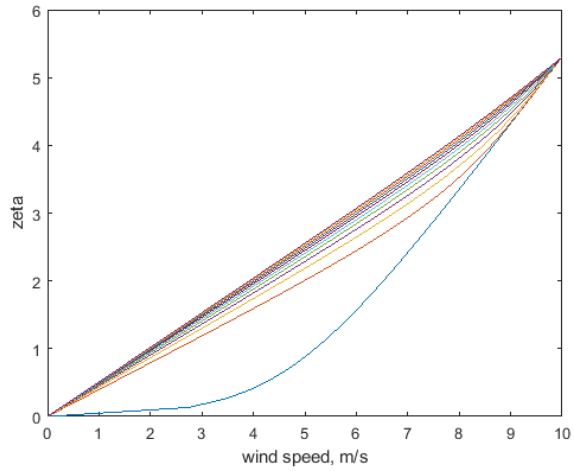
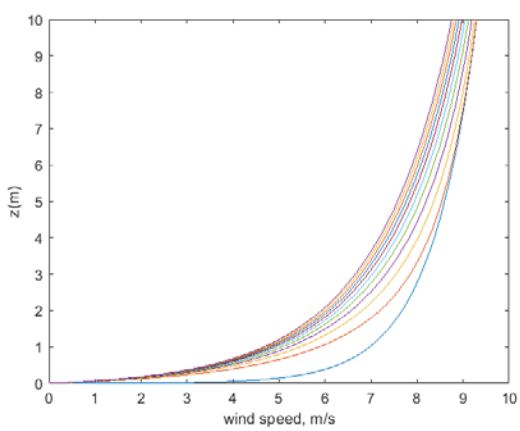
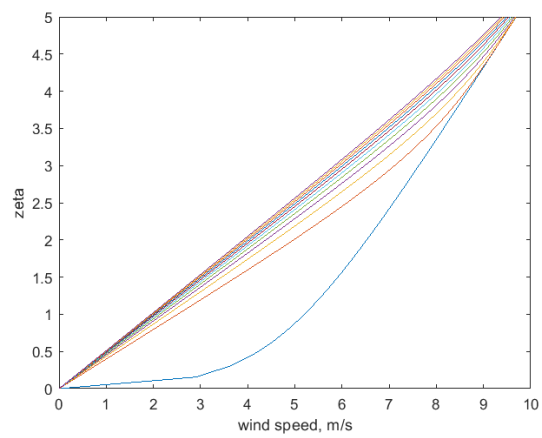
```
% Simplified Explicit IBL
steps=10;
z01=0.001; z02=0.1; z20=20; U0=10; vk=0.4;
N=41; ztop = 20; zetatop=log(1+ztop/z02);
z01p=z01/z02; z50p=z20/z02; dzeta=zetatop/(N-1);dzeta2=dzeta^2;
zetaA=ones(1,N); emzeta=ones(1,N); U0A=ones(1,N); zA=zeros(1,N);
UA=ones(1,N); UAN=ones(1,N);
ustar = vk*U0/log(1+z20/z01);
ustar2 = vk*U0/log(1+z20/z02); %changed for more mixing
for iz=1:N
    zeta=(iz-1)*dzeta;
    zetaA(iz)=zeta;
    emzeta(iz)= exp(-zeta);
    zA(iz)= (exp(zeta)-1)*z02;
    U0A(iz)=(ustar/vk)*log(1+zA(iz)/z01);
    UA(iz)=U0A(iz);
end
figure
plot(U0A,zetaA);
xlabel('wind speed, m/s')
ylabel('zeta')
ylim([0 6])
hold on
UAN(1)=0; UAN(N)=U0A(N);
%start of x stepping
dx = 0.01; dxp = dx/z02; x=0;
for iss = 1: steps
isteps = 5000;IWL=8;
   for is = 1:isteps
      x=x+dx;
      for iz = IWL:N-1
        UAN(iz)=UA(iz) +
(vk/U0)*ustar2*emzeta(iz)*dxp*(UA(iz+1)-2.0*UA(iz)+UA(iz-
1))/dzeta2;
      end
      for iz = 2:IWL-1
         UAN(iz)=UAN(IWL)*zetaA(iz)/zetaA(IWL); %log profile
near surface
         UA(iz)=UAN(iz);
      end
      for iz = 1:N
      UA(iz)=UAN(iz);
      end
   end
plot (UA,zetaA)
hold on
end
```

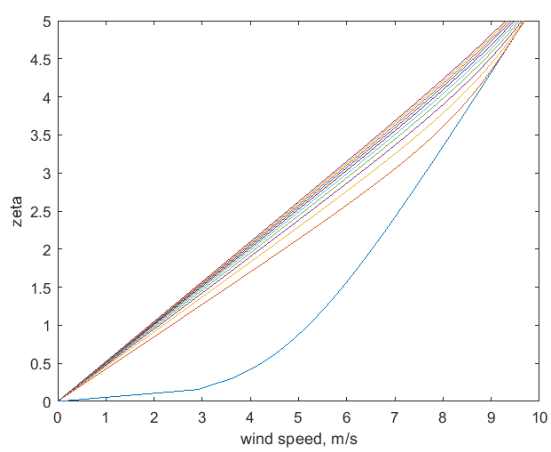
Simplified equations, U = UO = 10. K = ustar2*k*(z+z02), ztop = 20m

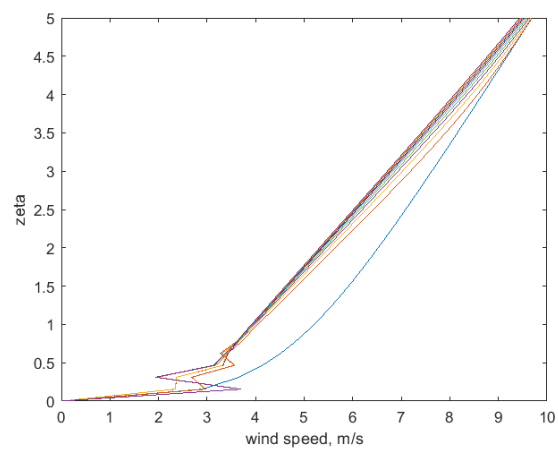


And from other tests









IWL = 8,4,2 Also U(z) added