Erratum

He, X.; Ku, D.N.; Moore, J.E., Jr. Simple calculation of the velocity profiles for pulsatile flow in a blood vessel using Mathematica. Ann. Biomed. Eng. 21:45-49; 1993.

The original publication of this program in the volume indicated above contained several typographical errors. Below are revisions to the computer program for Mathematica v 2.1.

```
modein   = Input["modein  ="];
modeout  = Input["modeout ="];
re       = Input["Re ="];
wo       = Input["Wo ="];
filename=InputString["Filename? "];
Print[" Program is running.   Waiting..."];
wavel = ReadList[filename];

nh       = 10;
sqi = I^1.5*wo;
l=Length[wavel];
mean=Sum[wavel[[i]],{i,l}]/l
wavel=wavel/mean;
wavelf=InverseFourier[wavel]*Sqrt[(2*nh-1)/l]//N;
b0 = Table[BesselJ[0,sqi*Sqrt[i]],{i,nh-1}];
b1 = Table[BesselJ[1,sqi*Sqrt[i]],{i,nh-1}];

hr[mode_Integer,i_Integer] :=
        If[i==0,
          If[mode==1,fr = 1,
          If[mode==2,fr =  0.125,
          If[mode==3,fr =  0.25,
          If[mode==4,fr = 0.5]]]],

          If[mode==1,fr = -b0[[i]]*sqi^2*i,
          If[mode==2,fr =  b0[[i]]-2*b1[[i]]/sqi/Sqrt[i],
          If[mode==3,fr =  b0[[i]]-1,
          If[mode==4,fr = -b1[[i]]*sqi*Sqrt[i]]]]]];
w1 = Table[wavelf[[i]]*hr[modeout,i-1]/hr[modein,i-1]//N
          ,{i,1,nh}];
w2 = Conjugate[Table[w1[[nh-i+1]],{i,nh-1}]];
wot=Re[Fourier[Join[w1,w2]]];

ListPlot[Table[{(i-1)*360/(l-1)//N,wavel[[i]]},{i,l}]
          ,Ticks->{{0,90,180,270,360},Automatic}
          ,PlotJoined->True]

ListPlot[Table[{(i-1)*180/(nh-1)//N,wot[[i]]},{i,nh*2-1}]
          ,Ticks->{{0,90,180,270,360},Automatic}
          ,PlotJoined->True]
```

```
Print["Minimum value: ",Min[wot]];
Print["Maximum value: ",Max[wot]];

Block[{i,k,nroot,negt},
k=1;
z[k] = 0;
For[i=2,i<=nh*2-1,i++,
   If[wot[[i-1]]*wot[[i]]<0,
      {k=k+1;
       z[k]=(i-1-wot[[i]]/(wot[[i]]-wot[[i-1]]))*180/(nh-1);
       Print[z[k]]
       }]];
   z[k+1]=360;
   nroot=k+1;

negt=0;
If[wot[[1]]<0,i0=1,i0=2];
For[i=i0,i<nroot,i+=2,negt=negt+z[i+1]-z[i]];
Print["Ratio of time for negative value: ",rot=negt/360]]


s1=Sum[wot[[i]],{i,nh*2-1}]/(nh*2-1);
s2=Sum[Abs[wot[[i]]],{i,nh*2-1}]/(nh*2-1);
roa = 0.5*(s2-s1)/s1




nn=20;
wot=Table[i,{i,0,nn}];
For[j=0,j<nn+1,j++,
w1 = Table[wavelf[[i+1]]*(b0[[i]] -
 BesselJ[0,sqi*Sqrt[i]*j/nn])/hr[modein,i],{i,nh-1}]//N;
w1 = Prepend[w1,(1-(j/nn)^2)*0.25*wavelf[[1]]/hr[modein,0]];
w2 = Conjugate[Table[w1[[nh-i+1]],{i,nh-1}]];
wot[[j]]=Table[Re[Fourier[Join[w1,w2]]]]
];

a=40/Max[wot[[0,1]]];
For[j=1,j<nh*2,j++,
e[j]=ListPlot[Table[{wot[[i,j]]*a+(j-1)*180/(nh-1),i/nn}
             ,{i,0,nn}]
             ,PlotRange->{{0,400},{0,1}}
             ,Ticks->{{0,90,180,270,360},
                       {0,0.2,0.4,0.6,0.8,1.}}
             ,DisplayFunction->Identity
             ,PlotJoined->True]];

Show[Release[Table[e[k],{k,1,nh*2-1}]],
     DisplayFunction->$DisplayFunction];
```