



Article

Computational Characterization of Mechanical, Hemodynamic, and Surface Interaction Conditions: Role of Protein Adsorption on the Regenerative Response of TEVGs

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A4. Additional times for Two Way FSI and Multiphysics models are available on:

<https://drive.google.com/drive/folders/1i0R3sRp-tfcw2KckQRCWrCHm0wP1WNrGO?usp=sharing>

A5. C code of inlet and outlet pressure UDF from DFT experimental pressure function reconstruction

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```
/******  
unsteady.c  
UDF FOR SPECIFYING A PULSATILE PRESSURE PROFILE BOUNDARY CONDI-  
TION  
*****/  
#include "udf.h"  
  
DEFINE_PROFILE(unsteady_pressureIN,thread,position)  
{  
    face_t f;  
    real t= CURRENT_TIME;  
    begin_f_loop(f,thread)  
    {  
        F_PROFILE(f,thread,position)=  
  
11984+  
((11.5848190353309*cos(0.8184*t*1))+(0.505073010755772*sin(0.8184*t*1)))+  
((18.1803330251078*cos(0.8184*t*2))+(-10.2282506216021*sin(0.8184*t*2)))+  
((8.20697838130978*cos(0.8184*t*3))+(-10.0868024426746*sin(0.8184*t*3)))+  
((7.68579892580832*cos(0.8184*t*4))+(-7.0201712233807*sin(0.8184*t*4)))+  
((11.3177822014377*cos(0.8184*t*5))+(-6.10447302102477*sin(0.8184*t*5)))+  
((12.1172783300953*cos(0.8184*t*6))+(-4.46469139877595*sin(0.8184*t*6)))+  
((14.883055602792*cos(0.8184*t*7))+(-6.76676672454061*sin(0.8184*t*7)))+  
((17.3497682113768*cos(0.8184*t*8))+(-7.97306857926715*sin(0.8184*t*8)))+  
((27.2582181444711*cos(0.8184*t*9))+(-18.1897267934749*sin(0.8184*t*9)))+  
((-6.85711814770048*cos(0.8184*t*10))+22.9475188779767*sin(0.8184*t*10)))+  
((11.5362592331759*cos(0.8184*t*11))+4.01419021466047*sin(0.8184*t*11)))+  
((16.6851906963304*cos(0.8184*t*12))+1.66908366785374*sin(0.8184*t*12)))+
```

$$\begin{aligned} & ((21.3609744467927*\cos(0.8184*t*13))+(-0.00508783487603878*\sin(0.8184*t*13)))+ \\ & ((27.1794586557867*\cos(0.8184*t*14))+(0.691896506099321*\sin(0.8184*t*14)))+ \\ & ((34.5160571959812*\cos(0.8184*t*15))+(-0.139435079346405*\sin(0.8184*t*15)))+ \\ & ((47.4502644759167*\cos(0.8184*t*16))+(-0.744678173963734*\sin(0.8184*t*16)))+ \\ & ((71.5101381766797*\cos(0.8184*t*17))+(-0.426666568094682*\sin(0.8184*t*17)))+ \\ & ((133.263501354685*\cos(0.8184*t*18))+(0.683034643440251*\sin(0.8184*t*18)))+ \\ & ((681.684336749673*\cos(0.8184*t*19))+(7.37694311909448*\sin(0.8184*t*19)))+ \\ & ((-240.295211605516*\cos(0.8184*t*20))+(-8.10943095509203*\sin(0.8184*t*20)))+ \\ & ((-105.999336539911*\cos(0.8184*t*21))+(-5.62823464637175*\sin(0.8184*t*21)))+ \\ & ((-69.6219042357097*\cos(0.8184*t*22))+(-4.54887952474233*\sin(0.8184*t*22)))+ \\ & ((-53.2921585322405*\cos(0.8184*t*23))+(-4.89337288797861*\sin(0.8184*t*23)))+ \\ & ((-42.3273221657101*\cos(0.8184*t*24))+(-5.01415760172456*\sin(0.8184*t*24)))+ \\ & ((-35.8304817722968*\cos(0.8184*t*25))+(-5.2100696494674*\sin(0.8184*t*25)))+ \\ & ((-32.6245995664206*\cos(0.8184*t*26))+(-6.19250060676557*\sin(0.8184*t*26)))+ \\ & ((-28.8128082226602*\cos(0.8184*t*27))+(-6.44229185502621*\sin(0.8184*t*27)))+ \\ & ((-27.0881851383044*\cos(0.8184*t*28))+(-8.15116535027251*\sin(0.8184*t*28)))+ \\ & ((-18.444713995999*\cos(0.8184*t*29))+(5.71163481286179*\sin(0.8184*t*29)))+ \\ & ((-22.0760739734296*\cos(0.8184*t*30))+(-6.92171620445279*\sin(0.8184*t*30)))+ \\ & ((-20.7949878442401*\cos(0.8184*t*31))+(-8.76617429404904*\sin(0.8184*t*31)))+ \\ & ((-19.8092503068205*\cos(0.8184*t*32))+(-10.7850298499079*\sin(0.8184*t*32)))+ \\ & ((-18.3726733180543*\cos(0.8184*t*33))+(-12.2791334226365*\sin(0.8184*t*33)))+ \\ & ((-18.0057978171997*\cos(0.8184*t*34))+(-15.9160694911892*\sin(0.8184*t*34)))+ \\ & ((-16.8093556984904*\cos(0.8184*t*35))+(-21.7197135688254*\sin(0.8184*t*35)))+ \\ & ((-15.8972286859847*\cos(0.8184*t*36))+(-31.2749407300406*\sin(0.8184*t*36)))+ \\ & ((-13.8435822242602*\cos(0.8184*t*37))+(-52.4592113570626*\sin(0.8184*t*37)))+ \\ & ((-7.87377018845932*\cos(0.8184*t*38))+(-157.903578870153*\sin(0.8184*t*38)))+ \\ & ((-25.7274874508789*\cos(0.8184*t*39))+(165.386309148527*\sin(0.8184*t*39)))+ \\ & ((-18.8968996402921*\cos(0.8184*t*40))+(55.5515595704263*\sin(0.8184*t*40)))+ \\ & ((-17.0254099845955*\cos(0.8184*t*41))+(33.9517546548542*\sin(0.8184*t*41)))+ \\ & ((-16.5442564287118*\cos(0.8184*t*42))+(24.7676087500265*\sin(0.8184*t*42)))+ \\ & ((-15.1192726379035*\cos(0.8184*t*43))+(19.1789507965267*\sin(0.8184*t*43)))+ \\ & ((-15.1429147953492*\cos(0.8184*t*44))+(15.7924148741265*\sin(0.8184*t*44)))+ \\ & ((-15.2295450856971*\cos(0.8184*t*45))+(14.4756962594285*\sin(0.8184*t*45)))+ \\ & ((-14.4742873041325*\cos(0.8184*t*46))+(12.5051487282413*\sin(0.8184*t*46)))+ \\ & ((-13.8344166178844*\cos(0.8184*t*47))+(11.4798939533467*\sin(0.8184*t*47)))+ \\ & ((-4.86621098553198*\cos(0.8184*t*48))+(15.4893927358387*\sin(0.8184*t*48)))+ \\ & ((-16.5424195696778*\cos(0.8184*t*49))+(8.47829101382788*\sin(0.8184*t*49)))+ \\ & ((-15.5780845239342*\cos(0.8184*t*50))+(8.41318348989221*\sin(0.8184*t*50)))+ \\ & ((-15.5697370157969*\cos(0.8184*t*51))+(7.77442153048774*\sin(0.8184*t*51)))+ \\ & ((-15.2230298597481*\cos(0.8184*t*52))+(7.65942371680304*\sin(0.8184*t*52)))+ \\ & ((-16.1104523734061*\cos(0.8184*t*53))+(7.45953007053394*\sin(0.8184*t*53)))+ \\ & ((-16.8293790727125*\cos(0.8184*t*54))+(7.32086632723692*\sin(0.8184*t*54)))+ \\ & ((-18.2598853946985*\cos(0.8184*t*55))+(7.71808549163615*\sin(0.8184*t*55)))+ \\ & ((-20.7111886489946*\cos(0.8184*t*56))+(8.50541497775705*\sin(0.8184*t*56)))+ \\ & ((-31.2127637473283*\cos(0.8184*t*57))+(12.9745164924131*\sin(0.8184*t*57)))+ \\ & ((47.960843009909*\cos(0.8184*t*58))+(-20.2365557105495*\sin(0.8184*t*58)))+ \\ & ((-0.489451772415908*\cos(0.8184*t*59))+(-0.411476613822758*\sin(0.8184*t*59)))+ \\ & ((-5.25899073075925*\cos(0.8184*t*60))+(1.15879997524127*\sin(0.8184*t*60)))+ \\ & ((-7.55837740268998*\cos(0.8184*t*61))+(2.24423061516044*\sin(0.8184*t*61)))+ \\ & ((-8.22200365211061*\cos(0.8184*t*62))+(2.07772108388226*\sin(0.8184*t*62)))+ \\ & ((-8.89290354588507*\cos(0.8184*t*63))+(2.5197094732288*\sin(0.8184*t*63)))+ \\ & ((-8.93088091365632*\cos(0.8184*t*64))+(2.45100025102585*\sin(0.8184*t*64)))+ \\ & ((-9.09995905470308*\cos(0.8184*t*65))+(2.13740970460636*\sin(0.8184*t*65)))+ \\ & ((-9.0245506592848*\cos(0.8184*t*66))+(1.09670228680153*\sin(0.8184*t*66)))+ \end{aligned}$$

$$\begin{aligned} &((-6.48881895755036*\cos(0.8184*t*67))+(-3.16701658286968*\sin(0.8184*t*67)))+ \\ &((-12.1640655523518*\cos(0.8184*t*68))+(7.05081796168471*\sin(0.8184*t*68)))+ \\ &((-10.847803082036*\cos(0.8184*t*69))+(4.5227272516895*\sin(0.8184*t*69)))+ \\ &((-11.1089502602836*\cos(0.8184*t*70))+(4.01259601459023*\sin(0.8184*t*70)))+ \\ &((-10.7080324771209*\cos(0.8184*t*71))+(3.87214521332718*\sin(0.8184*t*71)))+ \\ &((-10.8741144492822*\cos(0.8184*t*72))+(3.75552695863899*\sin(0.8184*t*72)))+ \\ &((-11.0192906995297*\cos(0.8184*t*73))+(3.46587632618739*\sin(0.8184*t*73)))+ \\ &((-10.4584555286795*\cos(0.8184*t*74))+(3.59681956623282*\sin(0.8184*t*74)))+ \\ &((-11.0177309139244*\cos(0.8184*t*75))+(3.19928042496966*\sin(0.8184*t*75)))+ \\ &((-11.3809991138873*\cos(0.8184*t*76))+(3.33831931835751*\sin(0.8184*t*76)))+ \\ &((-69.3298698194644*\cos(0.8184*t*77))+(26.0720482956451*\sin(0.8184*t*77)))+ \\ &((-9.62855923180421*\cos(0.8184*t*78))+(2.95292481763248*\sin(0.8184*t*78)))+ \\ &((-10.4560489646051*\cos(0.8184*t*79))+(2.95326917669047*\sin(0.8184*t*79)))+ \\ &((-10.0159268715691*\cos(0.8184*t*80))+(3.04440342594428*\sin(0.8184*t*80)))+ \\ &((-10.6373141814373*\cos(0.8184*t*81))+(2.48923227579114*\sin(0.8184*t*81)))+ \\ &((-10.6909366198952*\cos(0.8184*t*82))+(2.32436713902283*\sin(0.8184*t*82)))+ \\ &((-11.7511747152415*\cos(0.8184*t*83))+(3.2753637551172*\sin(0.8184*t*83)))+ \\ &((-11.5950112120887*\cos(0.8184*t*84))+(2.78525272256668*\sin(0.8184*t*84)))+ \\ &((-13.7046678365565*\cos(0.8184*t*85))+(3.09066219665449*\sin(0.8184*t*85)))+ \\ &((-19.0721686539981*\cos(0.8184*t*86))+(1.94654997766728*\sin(0.8184*t*86)))+ \\ &((8.63176878699876*\cos(0.8184*t*87))+(5.79999989146196*\sin(0.8184*t*87)))+ \\ &((-3.72077451119014*\cos(0.8184*t*88))+(4.29035945586166*\sin(0.8184*t*88)))+ \\ &((-5.95714374247349*\cos(0.8184*t*89))+(5.34584507545606*\sin(0.8184*t*89)))+ \\ &((-5.73694038092262*\cos(0.8184*t*90))+(4.88409756202778*\sin(0.8184*t*90)))+ \\ &((-6.24011898409634*\cos(0.8184*t*91))+(4.76100823083077*\sin(0.8184*t*91)))+ \\ &((-6.95622010391817*\cos(0.8184*t*92))+(5.84506644505721*\sin(0.8184*t*92)))+ \\ &((-5.79837563663023*\cos(0.8184*t*93))+(6.69559644229484*\sin(0.8184*t*93)))+ \\ &((-5.08158593463333*\cos(0.8184*t*94))+(9.94393838070548*\sin(0.8184*t*94)))+ \\ &((-0.392590027820302*\cos(0.8184*t*95))+(16.4614248565374*\sin(0.8184*t*95)))+ \\ &((30.4919724026039*\cos(0.8184*t*96))+(72.8743643499508*\sin(0.8184*t*96)))+ \\ &((-24.293052355973*\cos(0.8184*t*97)))+(-24.171923963087*\sin(0.8184*t*97)))+ \\ &((-15.9388556061468*\cos(0.8184*t*98)))+(-9.71358956557654*\sin(0.8184*t*98)))+ \\ &((-13.6527642262615*\cos(0.8184*t*99)))+(-6.29868511063399*\sin(0.8184*t*99)))+ \\ &((-13.4978071181351*\cos(0.8184*t*100)))+(-4.57569497649366*\sin(0.8184*t*100)))+ \\ &((-12.6481901526997*\cos(0.8184*t*101)))+(-2.77768896350216*\sin(0.8184*t*101)))+ \\ &((-10.8863656551372*\cos(0.8184*t*102)))+(-0.817932318573717*\sin(0.8184*t*102)))+ \\ &((-11.8140956905326*\cos(0.8184*t*103)))+(-2.1189586729358*\sin(0.8184*t*103)))+ \\ &((-11.5788726930541*\cos(0.8184*t*104)))+(-0.187137195762071*\sin(0.8184*t*104)))+ \\ &((-12.1138806277086*\cos(0.8184*t*105)))+(-0.784689095193963*\sin(0.8184*t*105)))+ \\ &((2.87932949782014*\cos(0.8184*t*106)))+(-18.8997410545421*\sin(0.8184*t*106)))+ \\ &((-8.37971616273325*\cos(0.8184*t*107)))+(-3.46007530205736*\sin(0.8184*t*107)))+ \\ &((-8.44707119166567*\cos(0.8184*t*108)))+(-2.3817487208479*\sin(0.8184*t*108)))+ \\ &((-8.69842443200775*\cos(0.8184*t*109)))+(-3.45922957593606*\sin(0.8184*t*109)))+ \\ &((-9.2500104719343*\cos(0.8184*t*110)))+(-3.25197761091793*\sin(0.8184*t*110)))+ \\ &((-8.01545697297323*\cos(0.8184*t*111)))+(-2.01994754990072*\sin(0.8184*t*111)))+ \\ &((-8.56622144072111*\cos(0.8184*t*112)))+(-4.39246834632599*\sin(0.8184*t*112)))+ \\ &((-6.85880093708771*\cos(0.8184*t*113)))+(-5.33779958504678*\sin(0.8184*t*113)))+ \\ &((-2.96630060481155*\cos(0.8184*t*114)))+(-10.2893491319307*\sin(0.8184*t*114)))+ \\ &((10.3567018060242*\cos(0.8184*t*115)))+(-29.498577850068*\sin(0.8184*t*115)))+ \\ &((-32.976437126392*\cos(0.8184*t*116)))+(33.3242156976643*\sin(0.8184*t*116)))+ \\ &((-18.5467979039862*\cos(0.8184*t*117)))+(11.4651747305617*\sin(0.8184*t*117)))+ \\ &((-17.079973696753*\cos(0.8184*t*118)))+(7.76468178863889*\sin(0.8184*t*118)))+ \\ &((-14.3478994509224*\cos(0.8184*t*119)))+(6.61098599091554*\sin(0.8184*t*119)))+ \\ &((-13.4643369297937*\cos(0.8184*t*120)))+(4.87551447645859*\sin(0.8184*t*120)))+ \end{aligned}$$

```
((-10.8689344362295*cos(0.8184*t*121))+(1.53019627766487*sin(0.8184*t*121)))+  
((-14.454630851817*cos(0.8184*t*122))+(3.69913763584565*sin(0.8184*t*122)))+  
((-12.8129424490451*cos(0.8184*t*123))+(3.35680940119923*sin(0.8184*t*123)))+  
((-15.4340115089367*cos(0.8184*t*124))+(2.52641393700493*sin(0.8184*t*124)))+  
((-21.8126549971515*cos(0.8184*t*125))+(7.71530274079081*sin(0.8184*t*125)));  
  
}  
end_f_loop(f,thread)  
}  
  
DEFINE_PROFILE(unsteady_pressureOut,thread,position)  
{  
    face_t f;  
    real t= CURRENT_TIME;  
    begin_f_loop(f,thread)  
    {  
        F_PROFILE(f,thread,position)=  
11819+  
(13.8408664964477*cos(0.8184*t*1))+(0.920925213547614*sin(0.8184*t*1)))+  
(20.4336742854027*cos(0.8184*t*2))+(-10.2912778096531*sin(0.8184*t*2)))+  
(10.162015278179*cos(0.8184*t*3))+(-9.85470101294347*sin(0.8184*t*3)))+  
(10.7345145376045*cos(0.8184*t*4))+(-6.31032682518727*sin(0.8184*t*4)))+  
(13.1836082565789*cos(0.8184*t*5))+(-5.60114854124748*sin(0.8184*t*5)))+  
(13.9018170274191*cos(0.8184*t*6))+(-4.91479942262448*sin(0.8184*t*6)))+  
(16.9119776125309*cos(0.8184*t*7))+(-6.52579961620085*sin(0.8184*t*7)))+  
(19.8459382539453*cos(0.8184*t*8))+(-8.42291344784412*sin(0.8184*t*8)))+  
(29.9352614287331*cos(0.8184*t*9))+(-18.5075434154291*sin(0.8184*t*9)))+  
(-4.80392153385418*cos(0.8184*t*10))+(24.4255507156381*sin(0.8184*t*10)))+  
(14.331821263733*cos(0.8184*t*11))+(5.17934665167207*sin(0.8184*t*11)))+  
(19.3719364024258*cos(0.8184*t*12))+(2.15935167351637*sin(0.8184*t*12)))+  
(24.3590595636397*cos(0.8184*t*13))+(1.52094066720457*sin(0.8184*t*13)))+  
(30.6649551869431*cos(0.8184*t*14))+(1.45105162969968*sin(0.8184*t*14)))+  
(39.450383473136*cos(0.8184*t*15))+(0.896453751325108*sin(0.8184*t*15)))+  
(52.7524274630163*cos(0.8184*t*16))+(2.18867606761909*sin(0.8184*t*16)))+  
(79.1904093020199*cos(0.8184*t*17))+(4.22679133909049*sin(0.8184*t*17)))+  
(145.645602863871*cos(0.8184*t*18))+(10.0260330808088*sin(0.8184*t*18)))+  
(737.823016435719*cos(0.8184*t*19))+(61.0292973975438*sin(0.8184*t*19)))+  
(-258.20433468771*cos(0.8184*t*20))+(-28.6405134309485*sin(0.8184*t*20)))+  
(-112.681042883453*cos(0.8184*t*21))+(-15.823467358546*sin(0.8184*t*21)))+  
(-73.692457081137*cos(0.8184*t*22))+(-11.6272475649021*sin(0.8184*t*22)))+  
(-54.9135385844324*cos(0.8184*t*23))+(-10.9719379359014*sin(0.8184*t*23)))+  
(-44.2977585646164*cos(0.8184*t*24))+(-10.5442806244501*sin(0.8184*t*24)))+  
(-37.6595688451036*cos(0.8184*t*25))+(-10.546178793995*sin(0.8184*t*25)))+  
(-33.1780806362461*cos(0.8184*t*26))+(-11.4129941066935*sin(0.8184*t*26)))+  
(-28.997399412734*cos(0.8184*t*27))+(-12.1263924343736*sin(0.8184*t*27)))+  
(-26.8832973205162*cos(0.8184*t*28))+(-13.695612164249*sin(0.8184*t*28)))+  
(-17.6187478222278*cos(0.8184*t*29))+(3.76051296210096*sin(0.8184*t*29)))+  
(-20.6427025829879*cos(0.8184*t*30))+(-12.1625129458517*sin(0.8184*t*30)))+  
(-19.4624619230373*cos(0.8184*t*31))+(-14.8151500612787*sin(0.8184*t*31)))+  
(-17.4477613020031*cos(0.8184*t*32))+(-16.8652172269556*sin(0.8184*t*32)))+  
(-15.3947242293289*cos(0.8184*t*33))+(-20.2262067660826*sin(0.8184*t*33)))+  
(-13.8192290452831*cos(0.8184*t*34))+(-25.2977824361574*sin(0.8184*t*34)))+  
(-10.7445208922532*cos(0.8184*t*35))+(-32.2219998161493*sin(0.8184*t*35)))+  
(-6.42399051087545*cos(0.8184*t*36))+(-46.1824482689753*sin(0.8184*t*36)))+
```

$$\begin{aligned} & ((2.35753030392489*\cos(0.8184*t*37))+(-75.9873618744117*\sin(0.8184*t*37)))+ \\ & ((44.1451687062335*\cos(0.8184*t*38))+(-224.953289308472*\sin(0.8184*t*38)))+ \\ & ((-83.6848987075868*\cos(0.8184*t*39))+(232.432096975134*\sin(0.8184*t*39)))+ \\ & ((-39.2684312422492*\cos(0.8184*t*40))+(76.3366054806798*\sin(0.8184*t*40)))+ \\ & ((-29.9287857801956*\cos(0.8184*t*41))+(46.138656867521*\sin(0.8184*t*41)))+ \\ & ((-26.1512540839123*\cos(0.8184*t*42))+(32.5026352320713*\sin(0.8184*t*42)))+ \\ & ((-23.6845098787149*\cos(0.8184*t*43))+(25.1166267372253*\sin(0.8184*t*43)))+ \\ & ((-23.0192954181119*\cos(0.8184*t*44))+(20.5669216945061*\sin(0.8184*t*44)))+ \\ & ((-21.8860099226846*\cos(0.8184*t*45))+(18.2094516571674*\sin(0.8184*t*45)))+ \\ & ((-20.6961490247336*\cos(0.8184*t*46))+(15.0768489449351*\sin(0.8184*t*46)))+ \\ & ((-19.3029656314952*\cos(0.8184*t*47))+(14.6780565256455*\sin(0.8184*t*47)))+ \\ & ((-7.74216778172151*\cos(0.8184*t*48))+(24.0933250411111*\sin(0.8184*t*48)))+ \\ & ((-22.8184607717223*\cos(0.8184*t*49))+(8.05665273611324*\sin(0.8184*t*49)))+ \\ & ((-22.4225890482641*\cos(0.8184*t*50))+(7.82891870688811*\sin(0.8184*t*50)))+ \\ & ((-21.7210584768587*\cos(0.8184*t*51))+(7.07319553617947*\sin(0.8184*t*51)))+ \\ & ((-22.317917309361*\cos(0.8184*t*52))+(5.54488917417147*\sin(0.8184*t*52)))+ \\ & ((-24.0849587624171*\cos(0.8184*t*53))+(4.64994733214328*\sin(0.8184*t*53)))+ \\ & ((-25.7973357923236*\cos(0.8184*t*54))+(3.90755155436795*\sin(0.8184*t*54)))+ \\ & ((-30.6648502688259*\cos(0.8184*t*55))+(1.6281556756253*\sin(0.8184*t*55)))+ \\ & ((-38.5481405173152*\cos(0.8184*t*56))+(-1.25504852211077*\sin(0.8184*t*56)))+ \\ & ((-70.0834037126999*\cos(0.8184*t*57))+(-11.962912046725*\sin(0.8184*t*57)))+ \\ & ((168.046329477883*\cos(0.8184*t*58))+(68.2069244242351*\sin(0.8184*t*58)))+ \\ & ((21.7277890862826*\cos(0.8184*t*59))+(17.1154575680275*\sin(0.8184*t*59)))+ \\ & ((7.5272152938262*\cos(0.8184*t*60))+(11.5641723052948*\sin(0.8184*t*60)))+ \\ & ((0.631279681268111*\cos(0.8184*t*61))+(9.29875298059939*\sin(0.8184*t*61)))+ \\ & ((-1.97594702734505*\cos(0.8184*t*62))+(8.30805018491591*\sin(0.8184*t*62)))+ \\ & ((-4.07161590218085*\cos(0.8184*t*63))+(8.37293155539119*\sin(0.8184*t*63)))+ \\ & ((-2.87068168583662*\cos(0.8184*t*64))+(7.58503628093781*\sin(0.8184*t*64)))+ \\ & ((-3.66065429897907*\cos(0.8184*t*65))+(6.63954712986074*\sin(0.8184*t*65)))+ \\ & ((-0.424467427498473*\cos(0.8184*t*66))+(6.77307446359535*\sin(0.8184*t*66)))+ \\ & ((14.9506123662015*\cos(0.8184*t*67))+(9.16591199663054*\sin(0.8184*t*67)))+ \\ & ((-22.9620630289905*\cos(0.8184*t*68))+(3.01783623192148*\sin(0.8184*t*68)))+ \\ & ((-14.6869227315181*\cos(0.8184*t*69))+(4.02951619080974*\sin(0.8184*t*69)))+ \\ & ((-12.132305466855*\cos(0.8184*t*70))+(3.4254022046543*\sin(0.8184*t*70)))+ \\ & ((-12.1840821157912*\cos(0.8184*t*71))+(2.94444054897564*\sin(0.8184*t*71)))+ \\ & ((-11.893460879336*\cos(0.8184*t*72))+(3.93902944964142*\sin(0.8184*t*72)))+ \\ & ((-10.7659734343927*\cos(0.8184*t*73))+(3.74419548888709*\sin(0.8184*t*73)))+ \\ & ((-11.5380784162063*\cos(0.8184*t*74))+(3.90375595732224*\sin(0.8184*t*74)))+ \\ & ((-10.1611651626373*\cos(0.8184*t*75))+(2.72351443665279*\sin(0.8184*t*75)))+ \\ & ((-9.78247853744317*\cos(0.8184*t*76))+(1.66396087011278*\sin(0.8184*t*76)))+ \\ & ((40.7888844931922*\cos(0.8184*t*77))+(-134.78653855811*\sin(0.8184*t*77)))+ \\ & ((-12.1908971250108*\cos(0.8184*t*78))+(4.24654940944126*\sin(0.8184*t*78)))+ \\ & ((-10.8191993290903*\cos(0.8184*t*79))+(2.92947907217917*\sin(0.8184*t*79)))+ \\ & ((-11.5454027505307*\cos(0.8184*t*80))+(3.26446738294726*\sin(0.8184*t*80)))+ \\ & ((-10.3483423584431*\cos(0.8184*t*81))+(3.1160454389992*\sin(0.8184*t*81)))+ \\ & ((-9.70029651689084*\cos(0.8184*t*82))+(3.54492320128412*\sin(0.8184*t*82)))+ \\ & ((-8.73135195461731*\cos(0.8184*t*83))+(0.590857390868776*\sin(0.8184*t*83)))+ \\ & ((-8.94847362919554*\cos(0.8184*t*84))+(1.32793130131655*\sin(0.8184*t*84)))+ \\ & ((-6.43005687516546*\cos(0.8184*t*85))+(-1.0303702908659*\sin(0.8184*t*85)))+ \\ & ((1.22143209941039*\cos(0.8184*t*86))+(-4.92770962318511*\sin(0.8184*t*86)))+ \\ & ((-35.8523216210297*\cos(0.8184*t*87))+(16.168234110332*\sin(0.8184*t*87)))+ \\ & ((-19.389656070412*\cos(0.8184*t*88))+(6.11556589909943*\sin(0.8184*t*88)))+ \\ & ((-16.8885352843545*\cos(0.8184*t*89))+(3.15928700144396*\sin(0.8184*t*89)))+ \\ & ((-16.8966575151449*\cos(0.8184*t*90))+(3.3570498188947*\sin(0.8184*t*90)))+ \end{aligned}$$

```
((-15.6269882458775*cos(0.8184*t*91)))+(3.26997033263291*sin(0.8184*t*91)))+  
((-15.3348084311456*cos(0.8184*t*92)))+(1.26031790968583*sin(0.8184*t*92)))+  
((-16.6107194008582*cos(0.8184*t*93)))+(0.795860897472321*sin(0.8184*t*93)))+  
((-18.465324928285*cos(0.8184*t*94)))+(-2.21219304363687*sin(0.8184*t*94)))+  
((-25.0935555361424*cos(0.8184*t*95)))+(-6.21409961995961*sin(0.8184*t*95)))+  
((-73.2543784009361*cos(0.8184*t*96)))+(-44.643786646671*sin(0.8184*t*96)))+  
((10.8213258716677*cos(0.8184*t*97)))+(20.4587859458835*sin(0.8184*t*97)))+  
((-1.54400076307518*cos(0.8184*t*98)))+(10.6893007486501*sin(0.8184*t*98)))+  
((-4.74814169912527*cos(0.8184*t*99)))+(8.39797288564973*sin(0.8184*t*99)))+  
((-5.64152896900597*cos(0.8184*t*100)))+(6.93971091858896*sin(0.8184*t*100)))+  
((-6.64759656885455*cos(0.8184*t*101)))+(5.58528409802487*sin(0.8184*t*101)))+  
((-9.06702128541373*cos(0.8184*t*102)))+(4.26213733174568*sin(0.8184*t*102)))+  
((-8.03475966295462*cos(0.8184*t*103)))+(4.99712560656189*sin(0.8184*t*103)))+  
((-8.83478405918337*cos(0.8184*t*104)))+(3.41362467384176*sin(0.8184*t*104)))+  
((-8.16861617216769*cos(0.8184*t*105)))+(3.82287366430839*sin(0.8184*t*105)))+  
((-12.7214051387143*cos(0.8184*t*106)))+(21.0609431799553*sin(0.8184*t*106)))+  
((-9.86904647914842*cos(0.8184*t*107)))+(6.59608096145454*sin(0.8184*t*107)))+  
((-10.1337366373202*cos(0.8184*t*108)))+(5.55301705757618*sin(0.8184*t*108)))+  
((-9.81027580094264*cos(0.8184*t*109)))+(6.04241357200281*sin(0.8184*t*109)))+  
((-9.22736172066468*cos(0.8184*t*110)))+(5.48292172711953*sin(0.8184*t*110)))+  
((-10.4963127463151*cos(0.8184*t*111)))+(4.68344802442455*sin(0.8184*t*111)))+  
((-9.57833835965702*cos(0.8184*t*112)))+(6.03759098992706*sin(0.8184*t*112)))+  
((-10.4734647534639*cos(0.8184*t*113)))+(6.72026250180016*sin(0.8184*t*113)))+  
((-11.4743184261589*cos(0.8184*t*114)))+(9.9209786832631*sin(0.8184*t*114)))+  
((-14.0571738970304*cos(0.8184*t*115)))+(21.4935591046248*sin(0.8184*t*115)))+  
((-5.32751414106385*cos(0.8184*t*116)))+(-16.9445501931388*sin(0.8184*t*116)))+  
((-7.98220076435859*cos(0.8184*t*117)))+(-3.86449436966366*sin(0.8184*t*117)))+  
((-7.80426569391827*cos(0.8184*t*118)))+(-1.73476784551681*sin(0.8184*t*118)))+  
((-8.89347554201169*cos(0.8184*t*119)))+(-0.948413404126034*sin(0.8184*t*119)))+  
((-9.07542005013518*cos(0.8184*t*120)))+(-0.033714888526718*sin(0.8184*t*120)))+  
((-10.0999399159378*cos(0.8184*t*121)))+(2.33093570213312*sin(0.8184*t*121)))+  
((-8.35193903261376*cos(0.8184*t*122)))+(0.584858385805653*sin(0.8184*t*122)))+  
((-9.13990155997818*cos(0.8184*t*123)))+(0.815827466773143*sin(0.8184*t*123)))+  
((-7.45250099962571*cos(0.8184*t*124)))+(0.906538145433625*sin(0.8184*t*124)))+  
((-3.80423305047201*cos(0.8184*t*125)))+(-2.86629861790881*sin(0.8184*t*125));  
}  
end_f_loop(f,thread)  
}
```