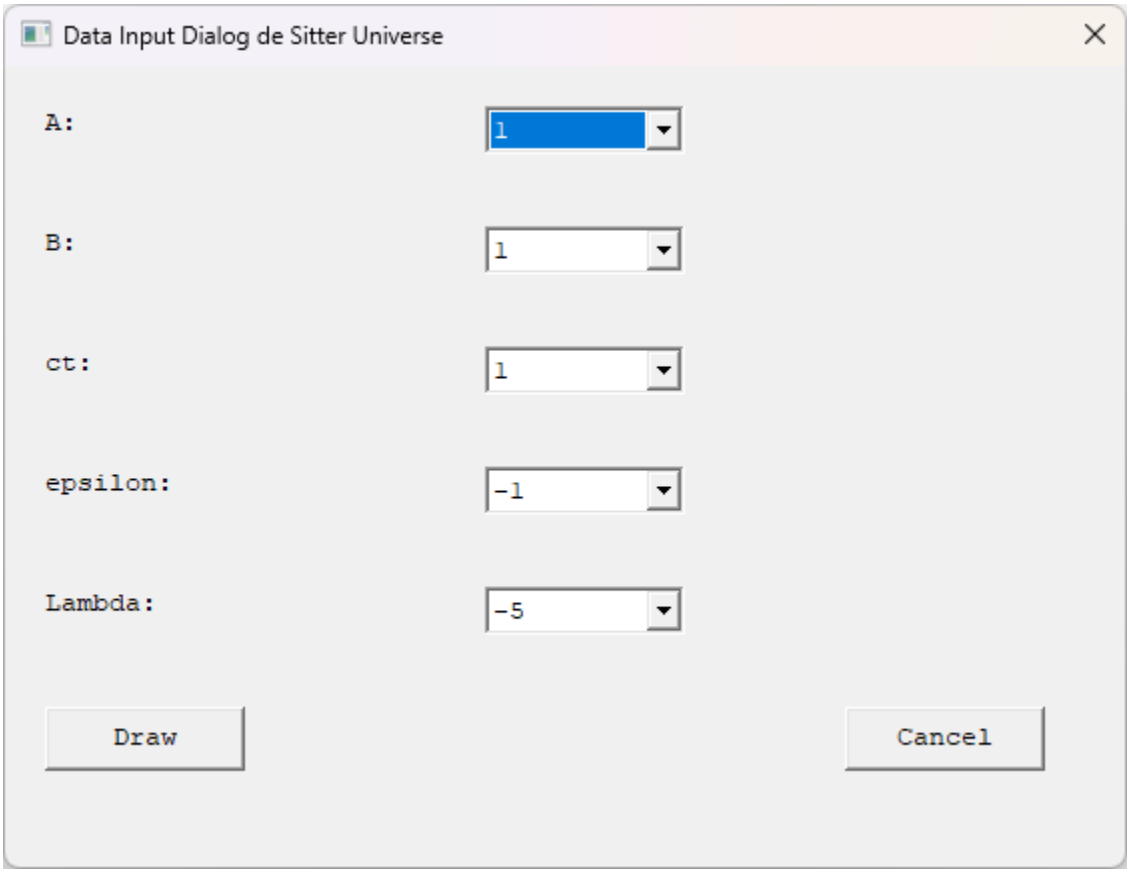
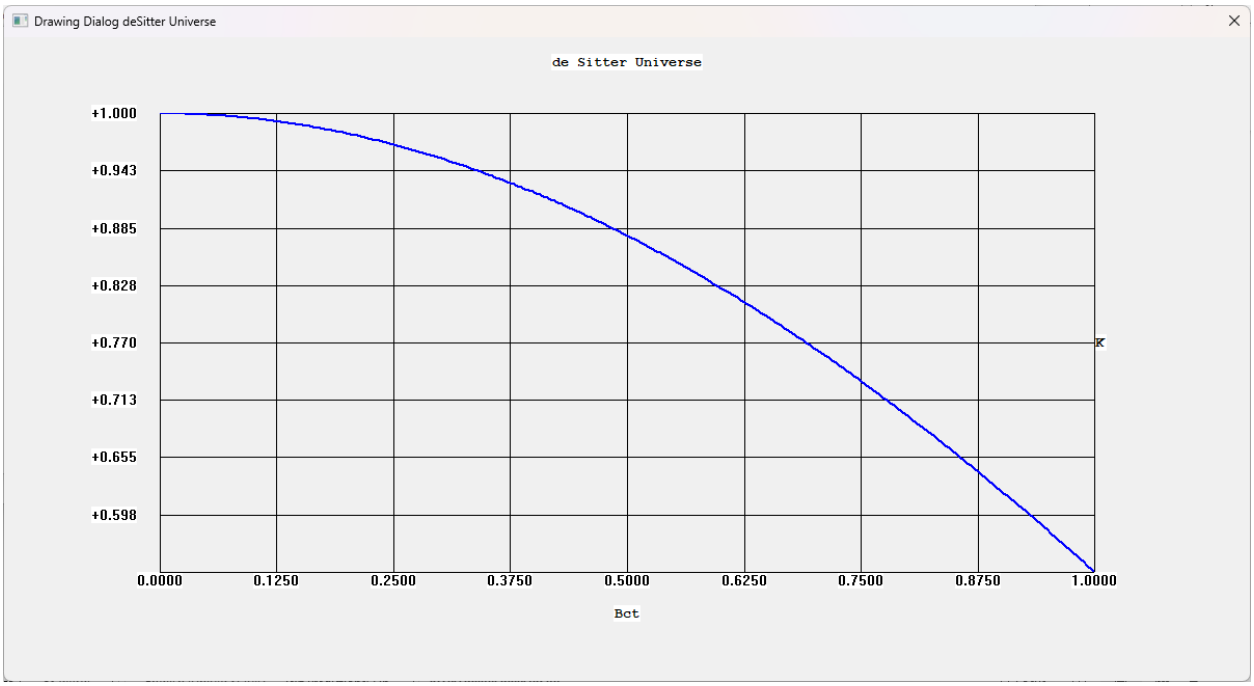
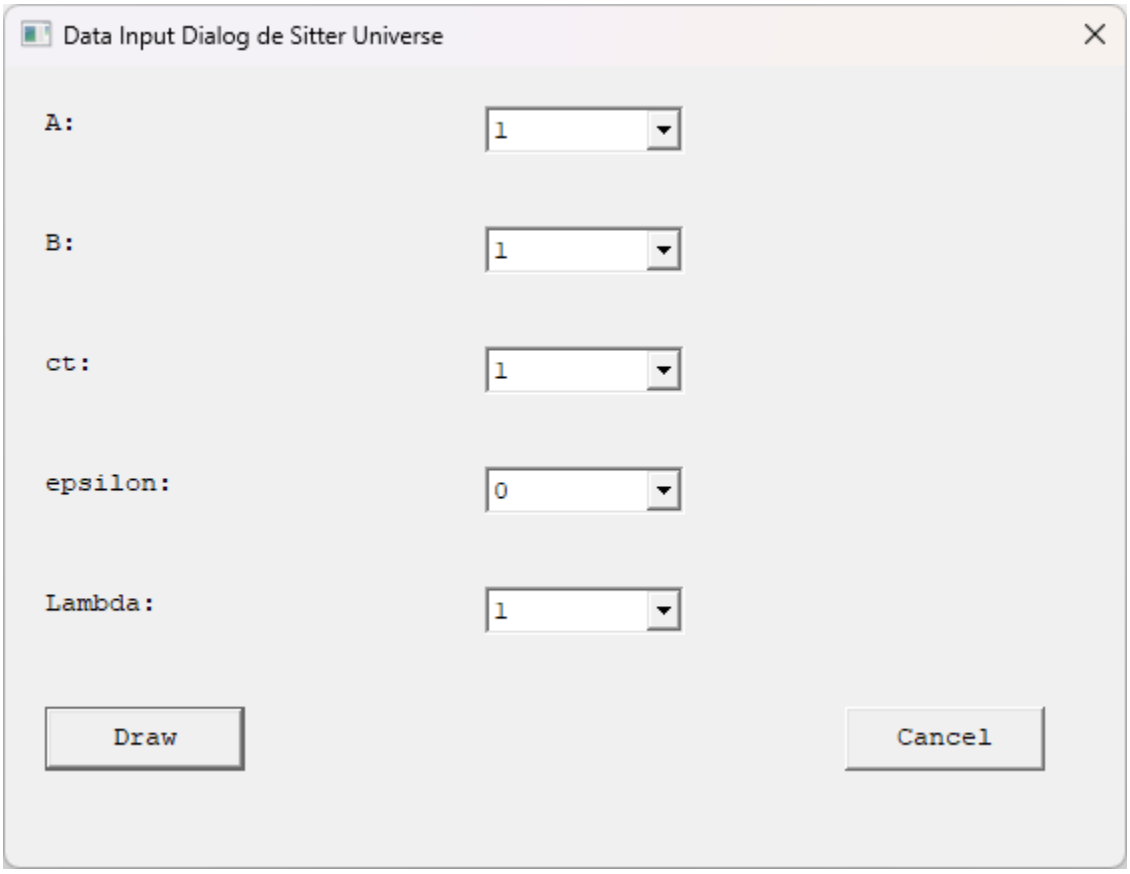
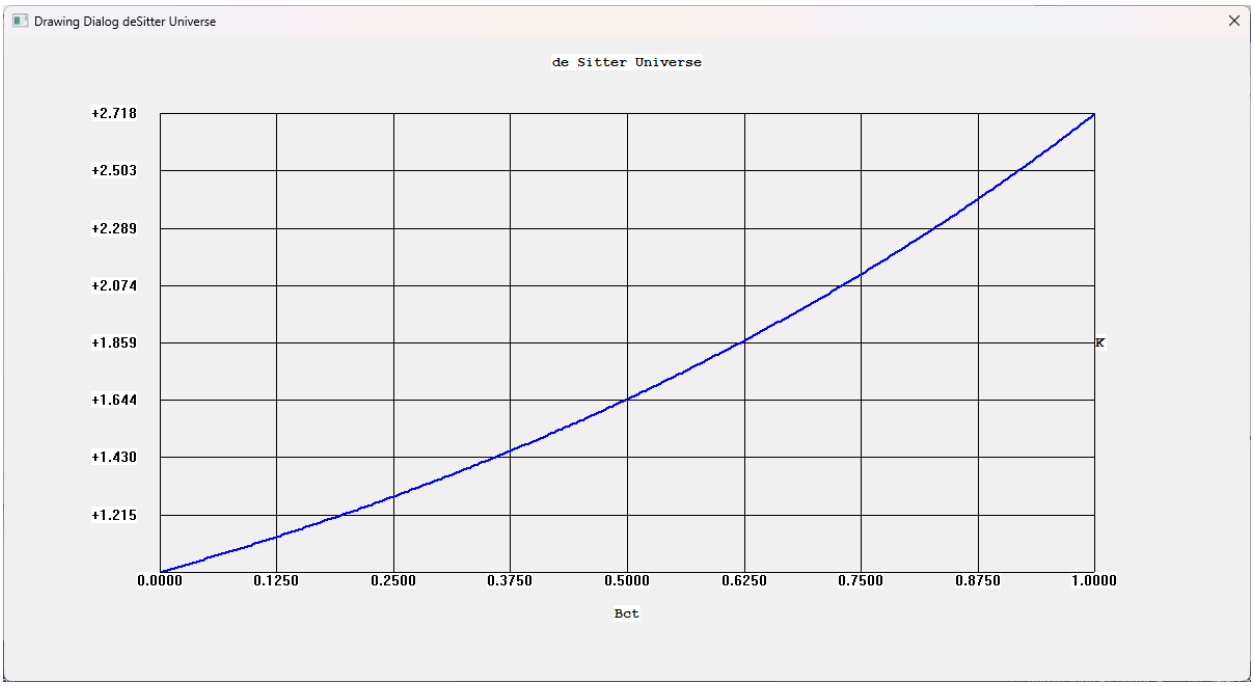
Blog Input © Saturday, March 21, 2026, by James Pate Williams, Jr., Three Model Universes
Reference: "General Relativity: An Introduction to the theory of the gravitational field" © 1982 by Hans Stephani translated from German by Martin Pollack and John Stewart

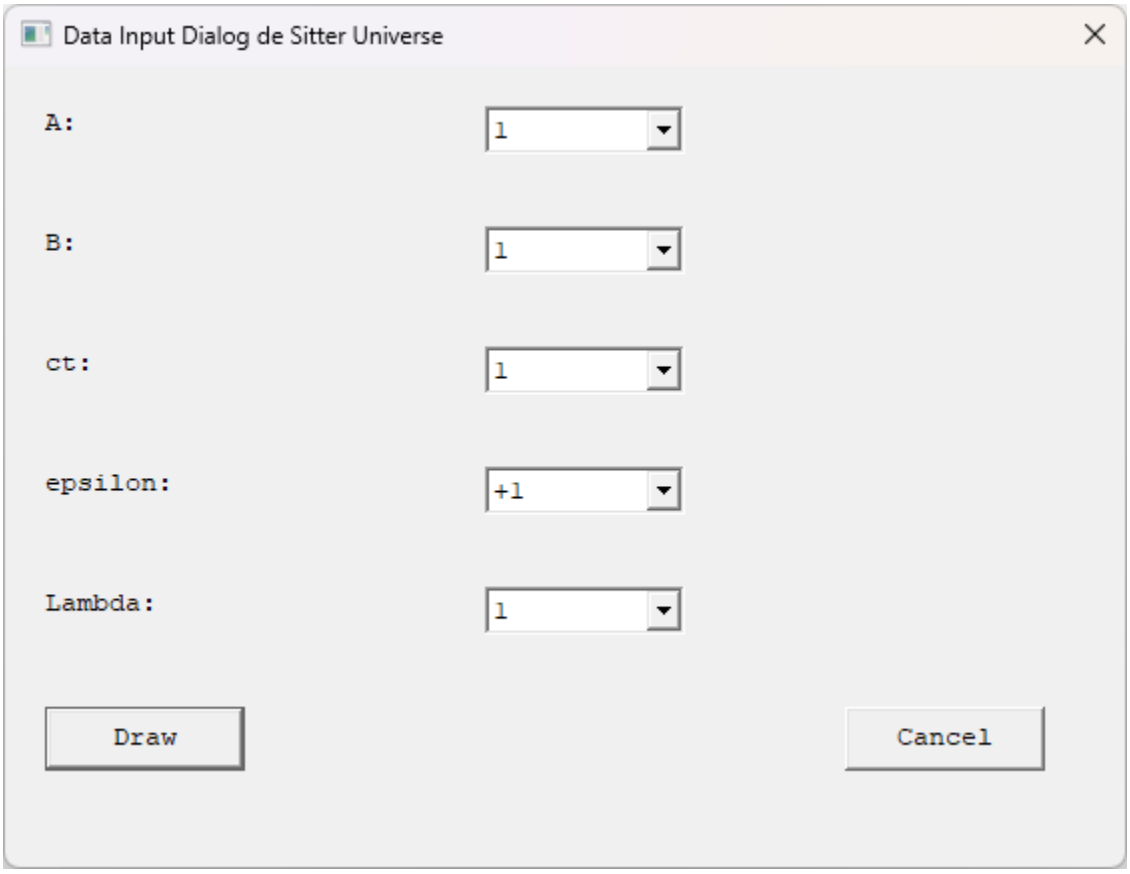
The three models are the de Sitter, Radiation, and Friedmann model universes.

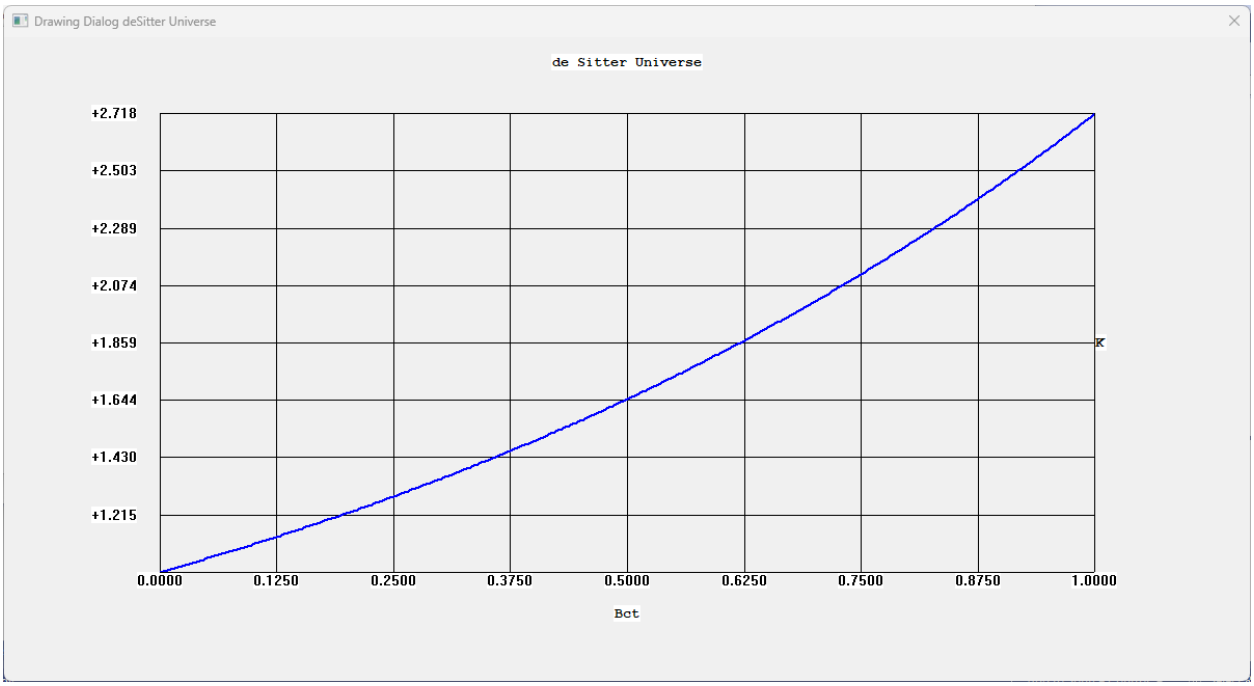


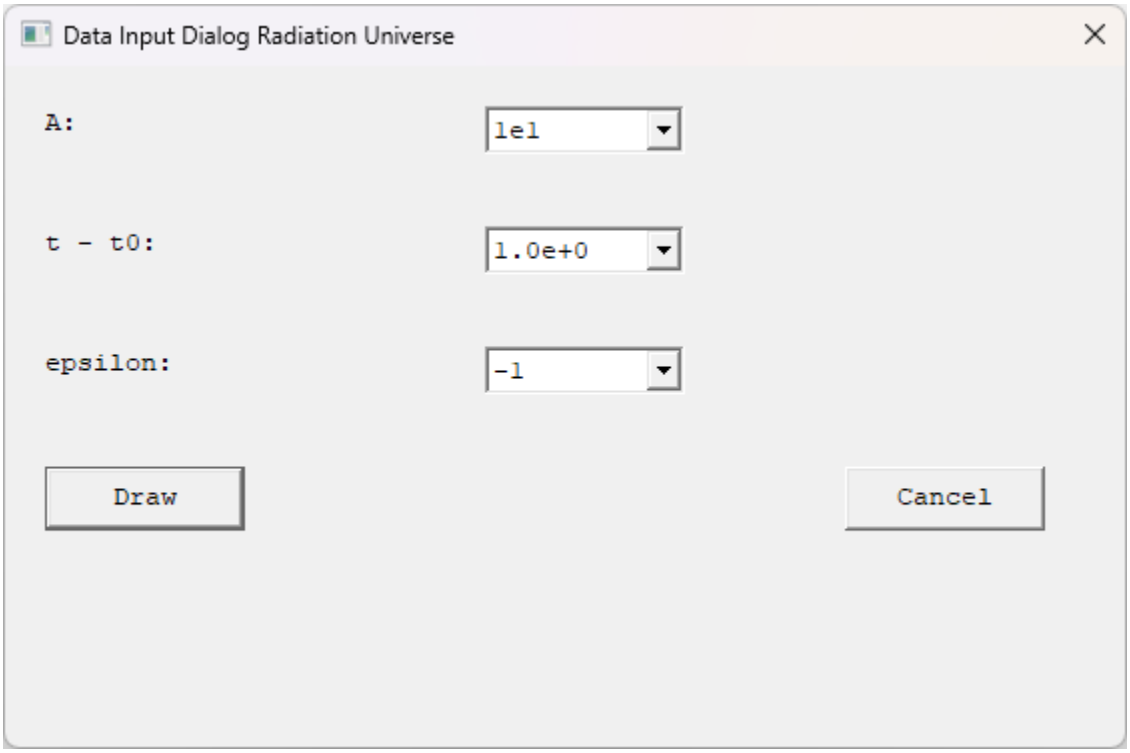

Drawing Dialog deSitter Universe
de Sitter Universe
+1.000
+0.943
+0.885
+0.828
+0.770
+0.713
+0.655
+0.598
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
Bct

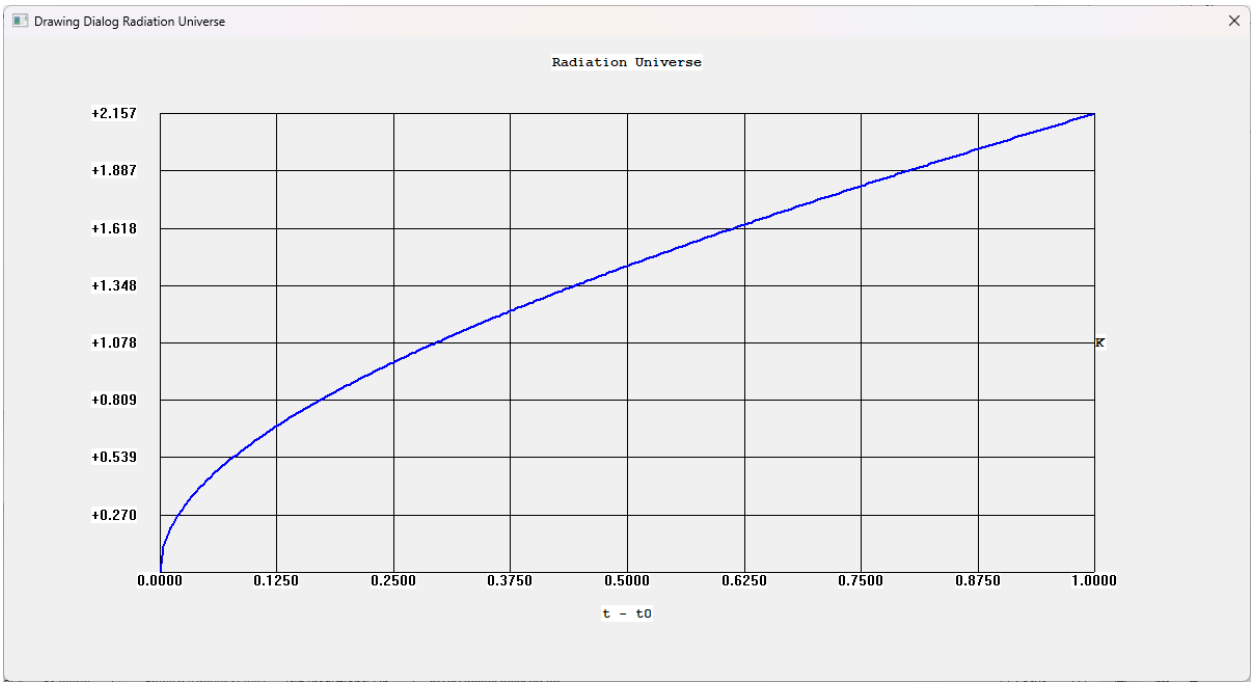

Data Input Dialog de Sitter Universe
A:
1
B:
1
ct:
1
epsilon:
0
Lambda:
1
Draw
Cancel

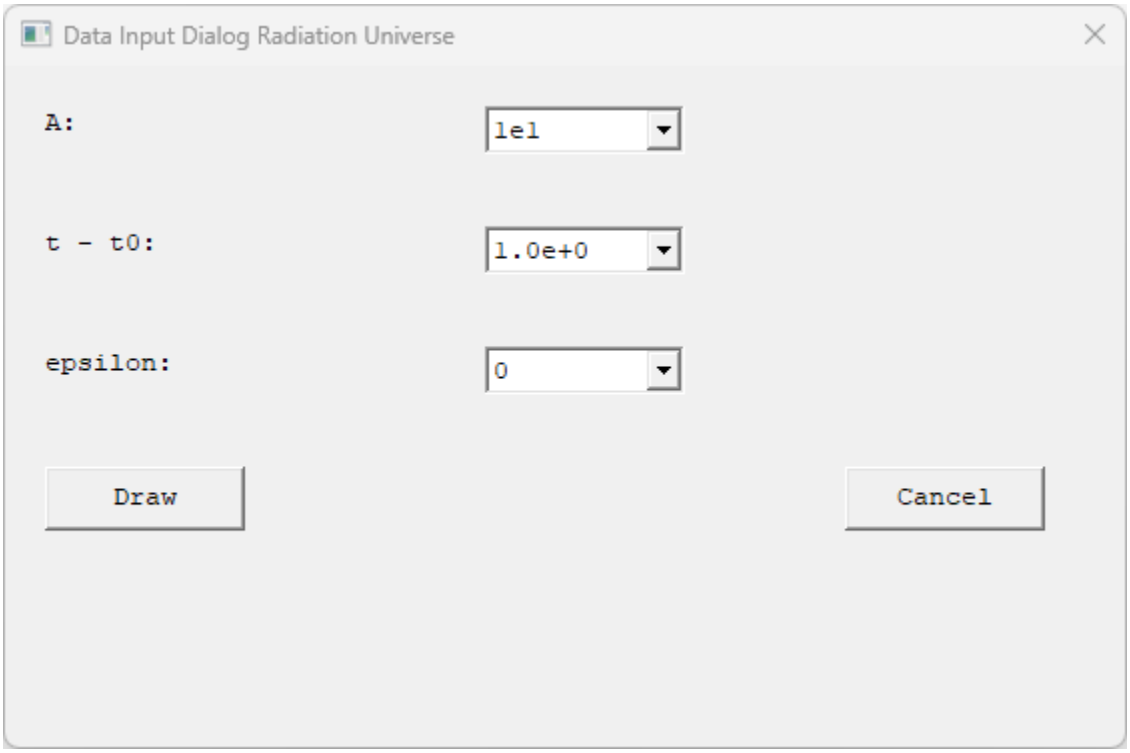

Drawing Dialog deSitter Universe
de Sitter Universe
+2.718
+2.503
+2.289
+2.074
+1.859
+1.644
+1.430
+1.215
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
Bct

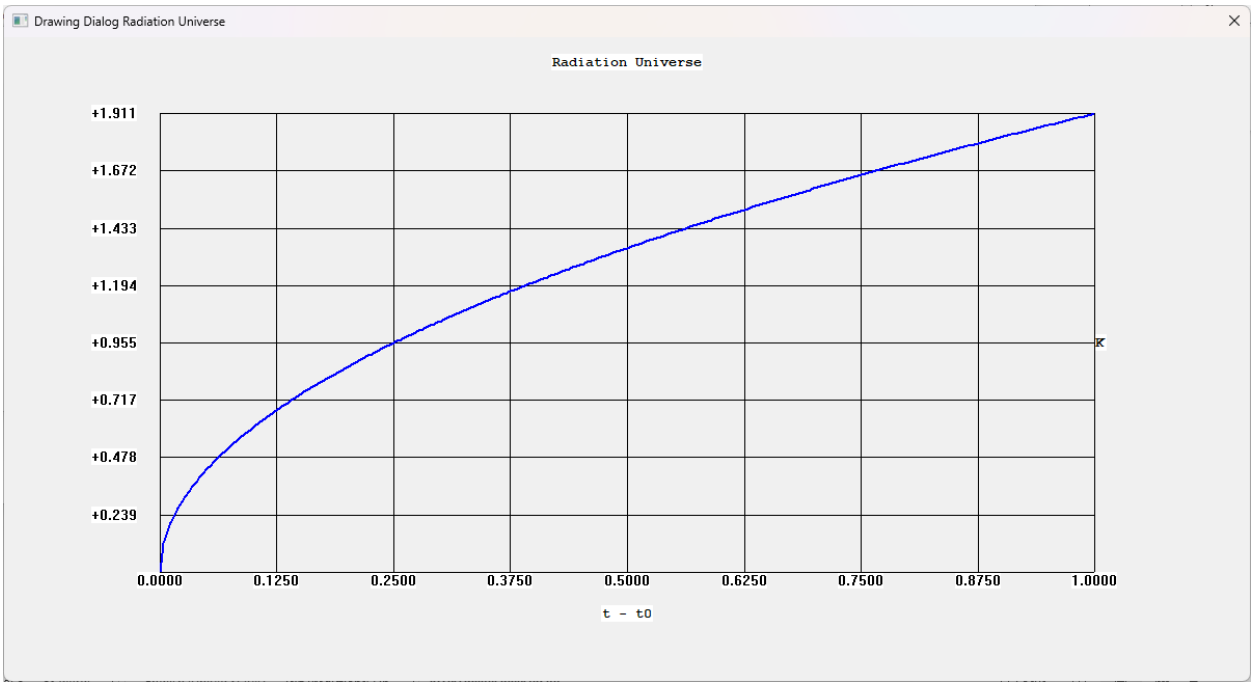

Data Input Dialog de Sitter Universe
A:
1
B:
1
ct:
1
epsilon:
+1
Lambda:
1
Draw
Cancel

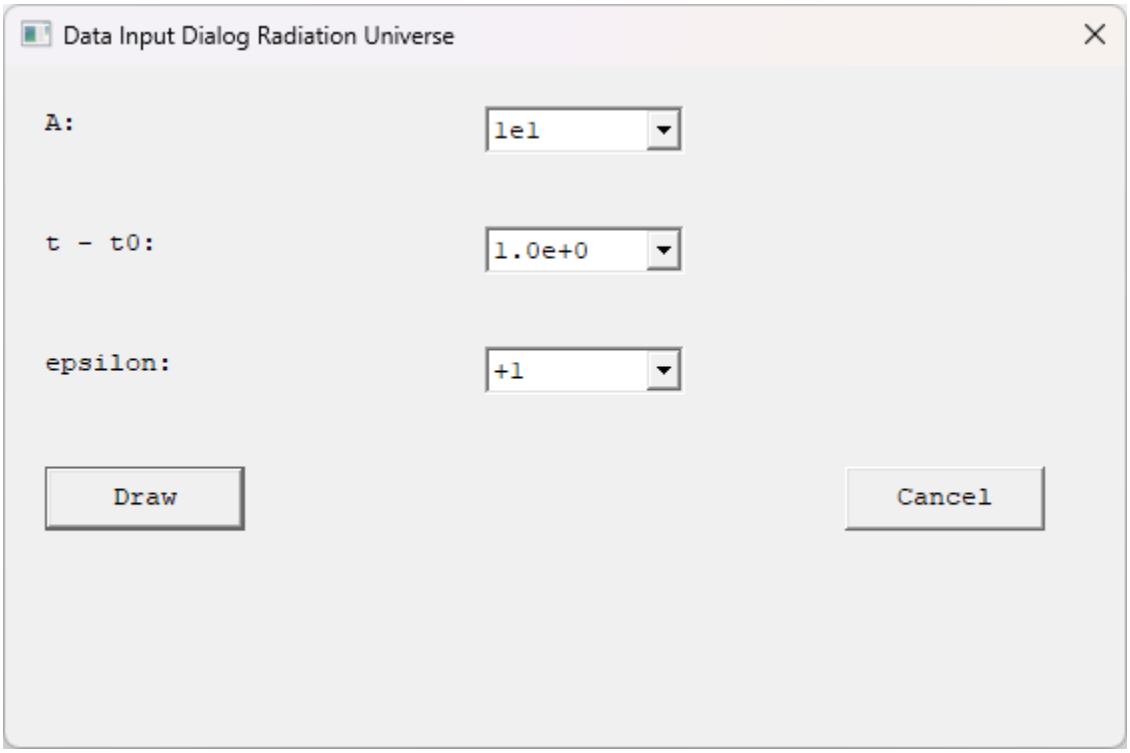

Drawing Dialog deSitter Universe
de Sitter Universe
+2.718
+2.503
+2.289
+2.074
+1.859
+1.644
+1.430
+1.215
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
Bct

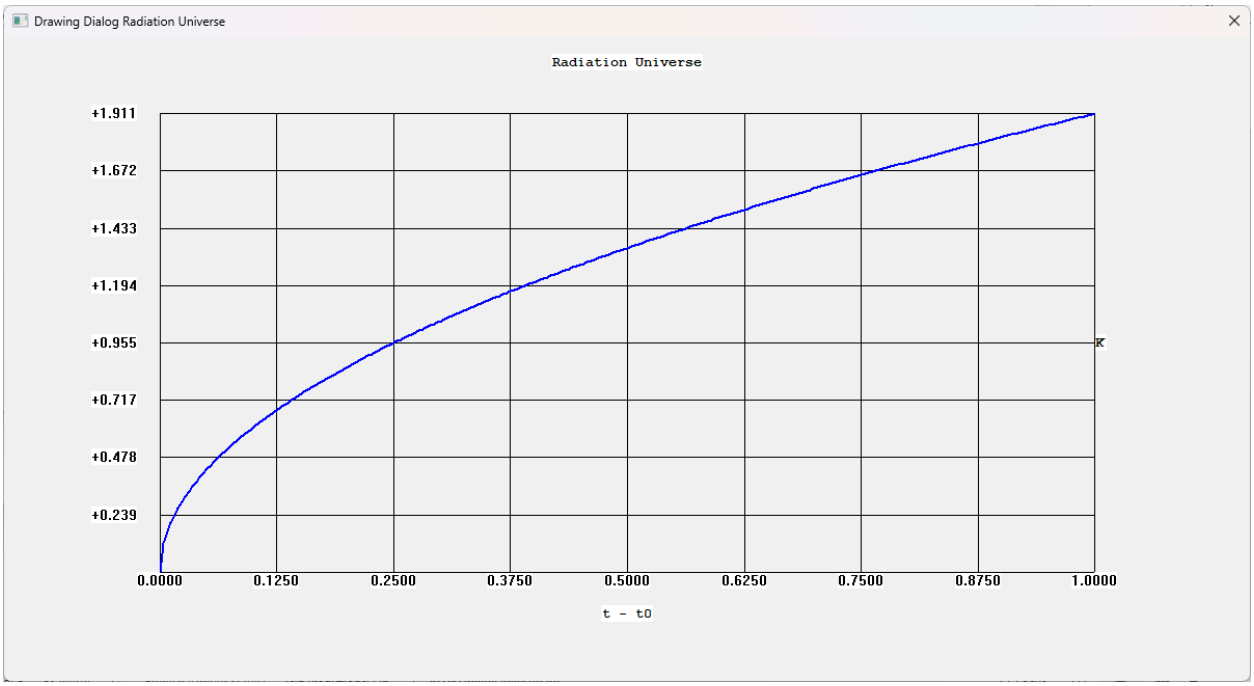

Data Input Dialog Radiation Universe
A:
1e1
t - t0:
1.0e+0
epsilon:
-1
Draw
Cancel

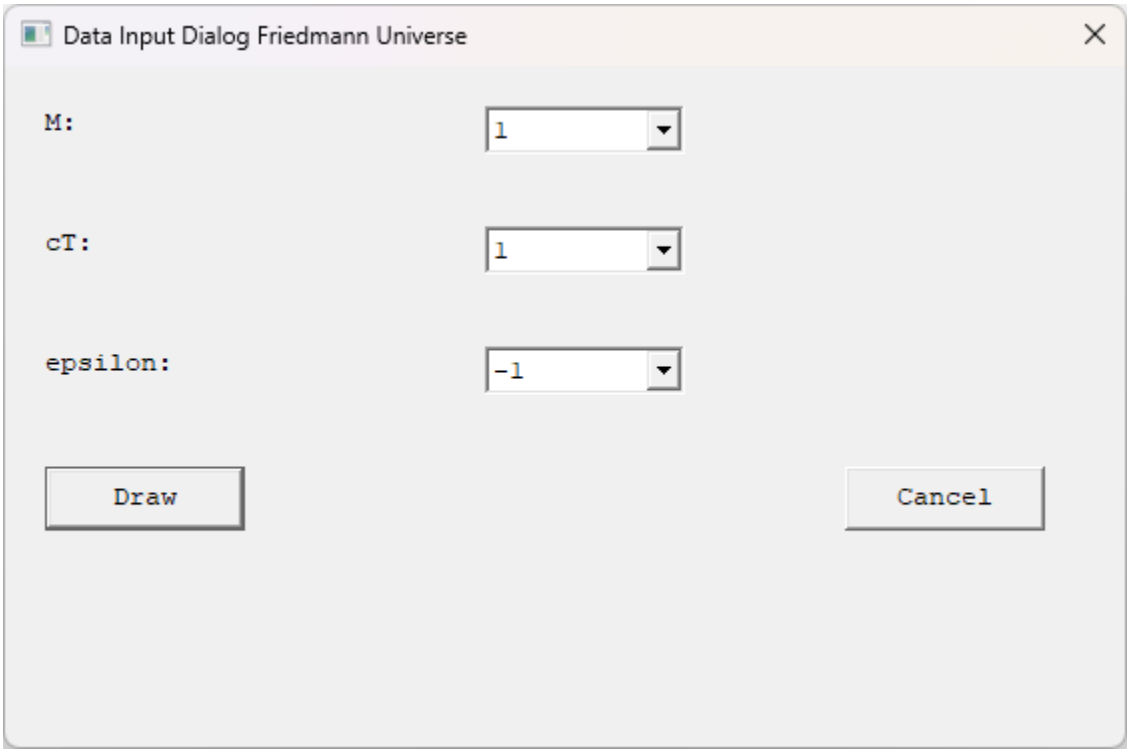

Drawing Dialog Radiation Universe
Radiation Universe
+2.157
+1.887
+1.618
+1.348
+1.078
+0.809
+0.539
+0.270
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
t - t0

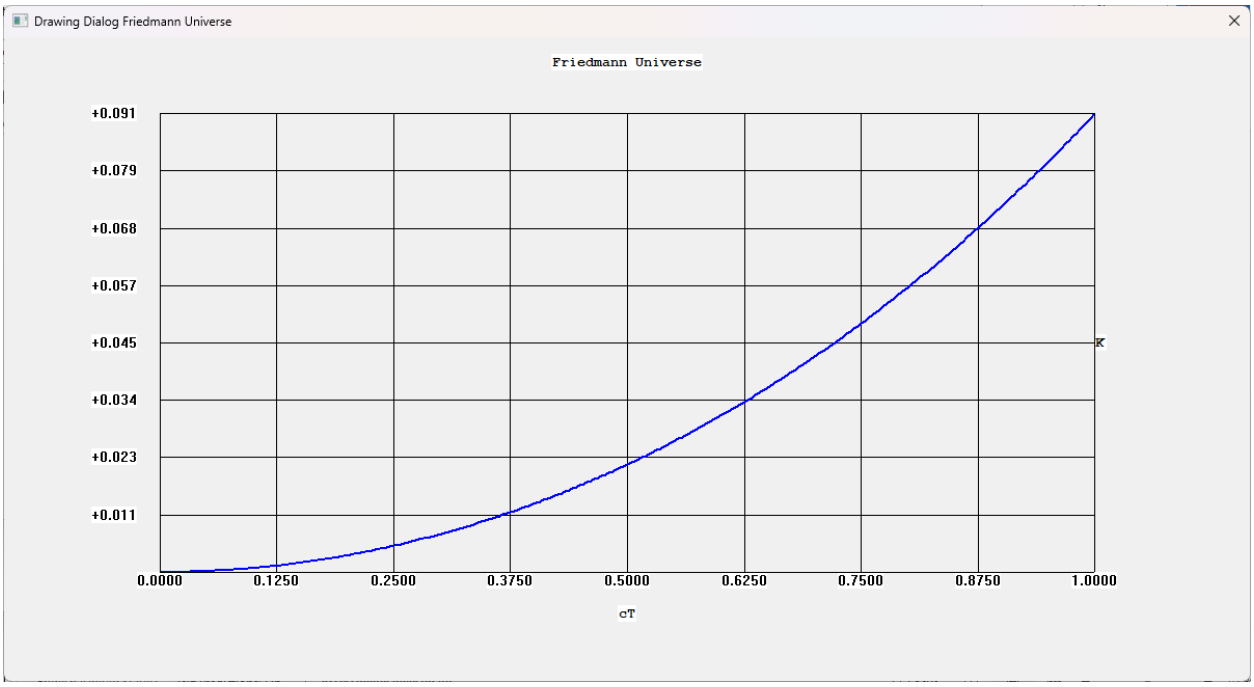

Data Input Dialog Radiation Universe
A:
1e1
t - t0:
1.0e+0
epsilon:
0
Draw
Cancel

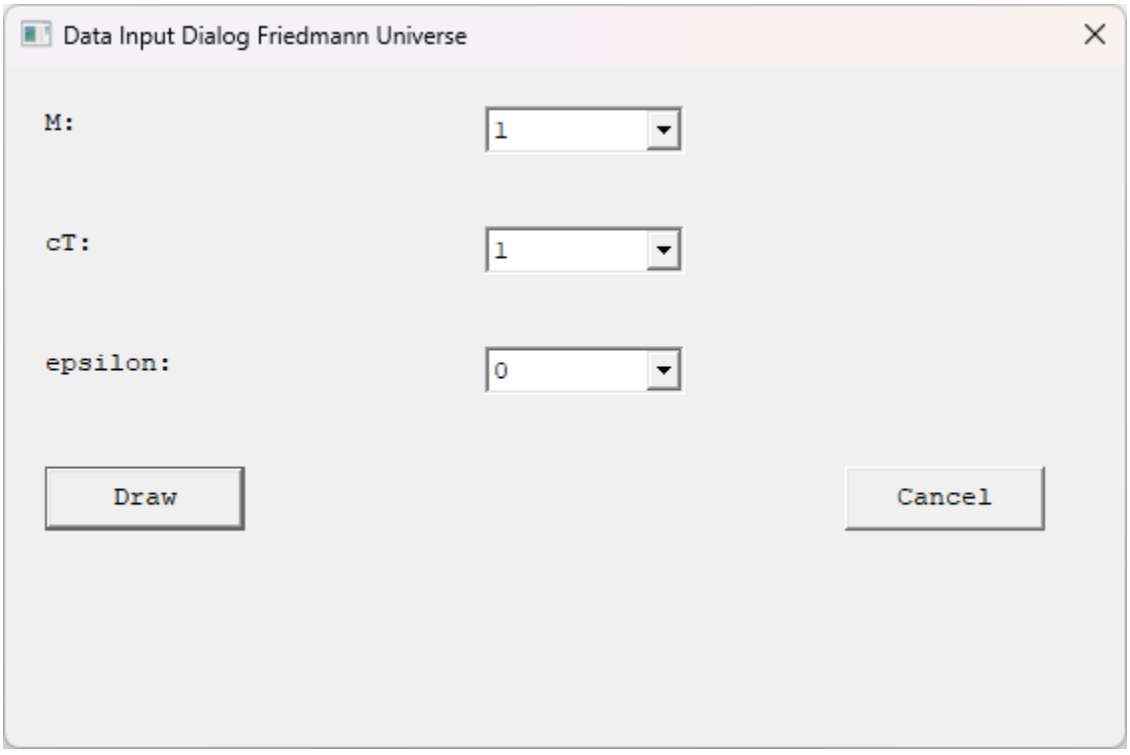

Drawing Dialog Radiation Universe
Radiation Universe
+1.911
+1.672
+1.433
+1.194
+0.955
+0.717
+0.478
+0.239
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
t - t0

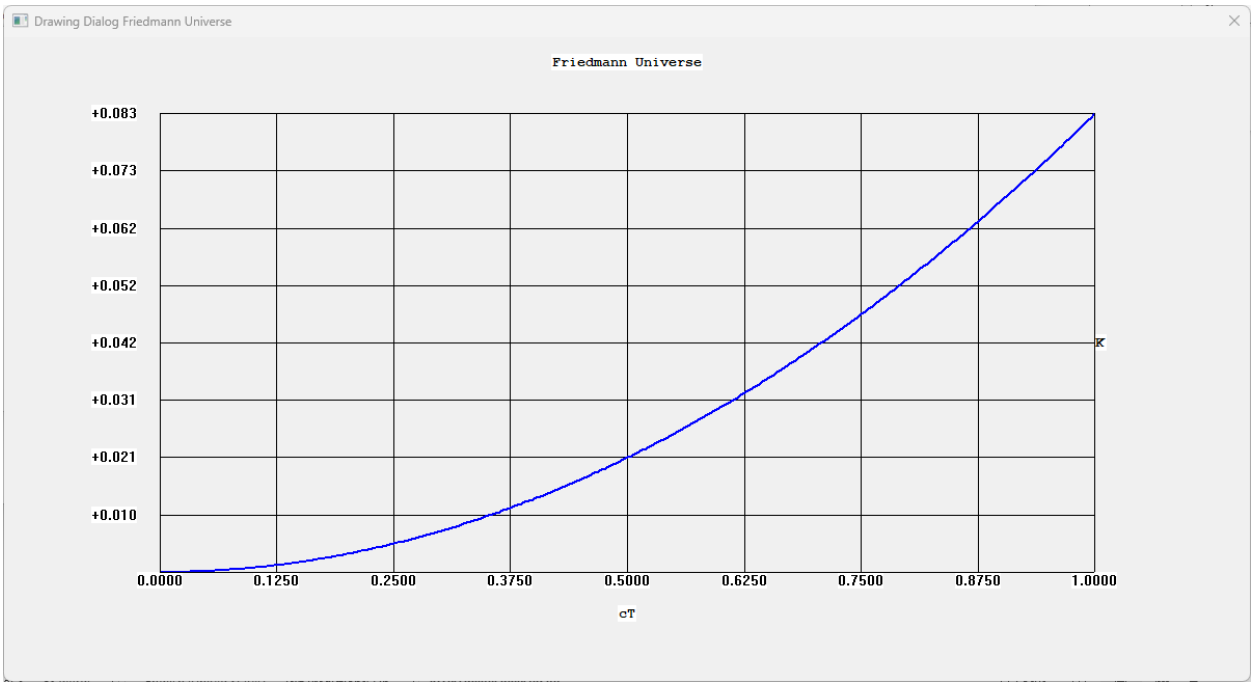

Data Input Dialog Radiation Universe
A:
1e1
t - t0:
1.0e+0
epsilon:
+1
Draw
Cancel

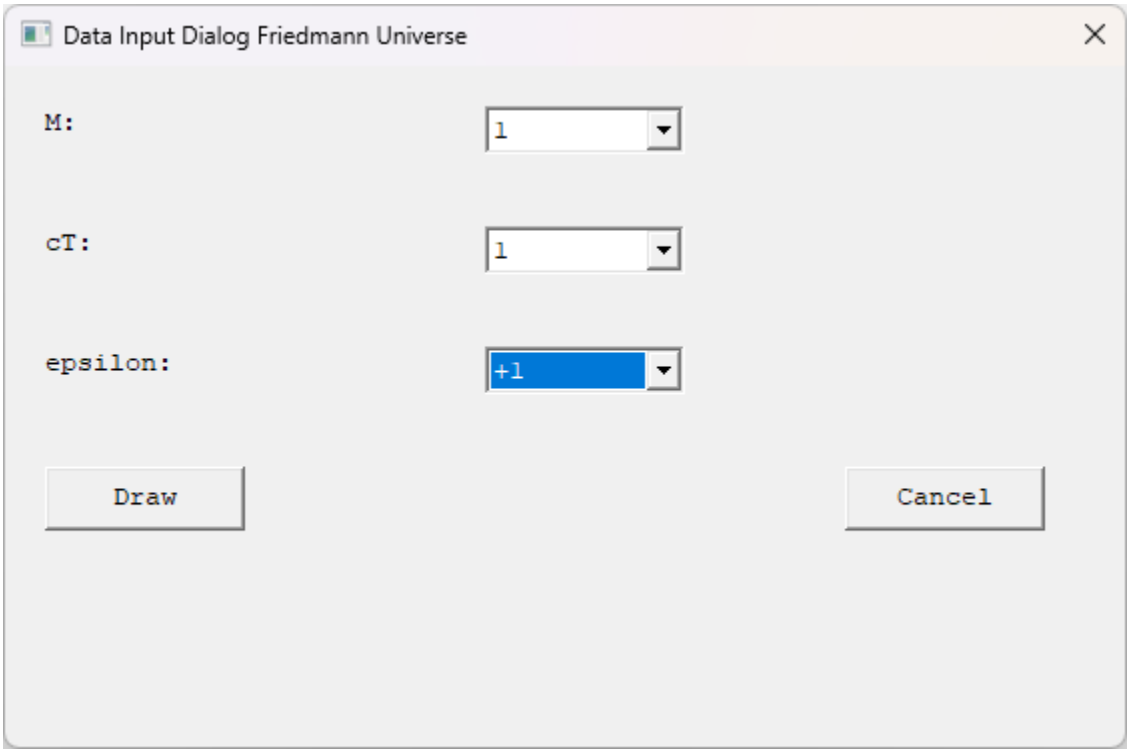

Drawing Dialog Radiation Universe
Radiation Universe
+1.911
+1.672
+1.433
+1.194
+0.955
+0.717
+0.478
+0.239
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
t - t0

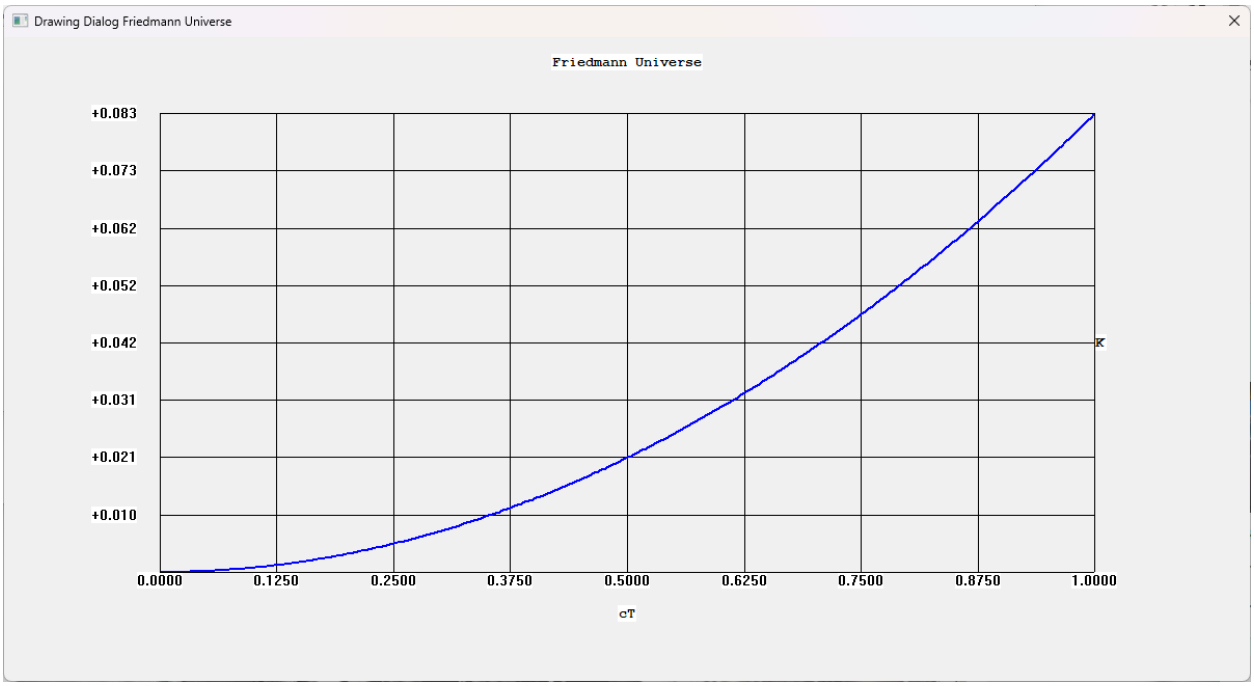

Data Input Dialog Friedmann Universe
M:
1
cT:
1
epsilon:
-1
Draw
Cancel


Drawing Dialog Friedmann Universe
Friedmann Universe
+0.091
+0.079
+0.068
+0.057
+0.045
+0.034
+0.023
+0.011
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
cT


Data Input Dialog Friedmann Universe
M:
1
cT:
1
epsilon:
0
Draw
Cancel


Drawing Dialog Friedmann Universe
Friedmann Universe
+0.083
+0.073
+0.062
+0.052
+0.042
+0.031
+0.021
+0.010
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
cT


Data Input Dialog Friedmann Universe
M:
1
cT:
1
epsilon:
+1
Draw
Cancel


Drawing Dialog Friedmann Universe
Friedmann Universe
+0.083
+0.073
+0.062
+0.052
+0.042
+0.031
+0.021
+0.010
K
0.0000
0.1250
0.2500
0.3750
0.5000
0.6250
0.7500
0.8750
1.0000
cT