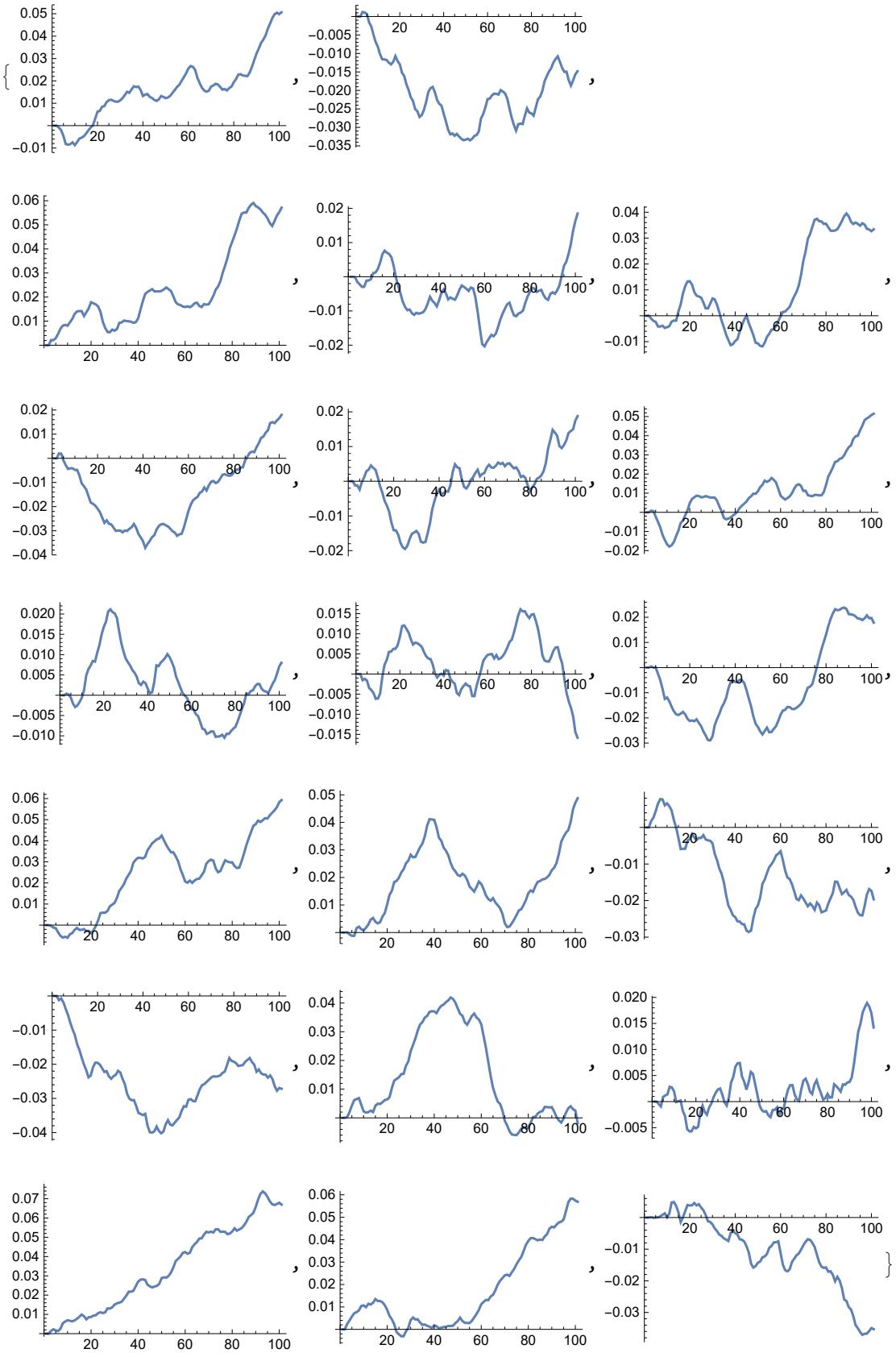
```
ncoll = 20;
sig = 3;
m = .25; b = 8.1;
ep = 0.01; nstep = 100;
Print["Time tot = ", nstep * ep, "       1/gam = ", m / b,
 "       Temp = ", .5 sig^2 / b, "          alpha = ", (sig / b)^2]
Table[rantab = RandomVariate[NormalDistribution[0, sig], nstep + 1];
  Lang = RecurrenceTable[{x[n + 2] == (2 - b ep / m) x[n + 1] + (b ep / m - 1) x[n] +
       rantab[[n + 1]] ep^2 / m, x[0] == 0, x[1] == 0}, x, {n, 0, nstep}];
  ListPlot[Lang, Joined → True]
  , {i, ncoll}] // Quiet
```

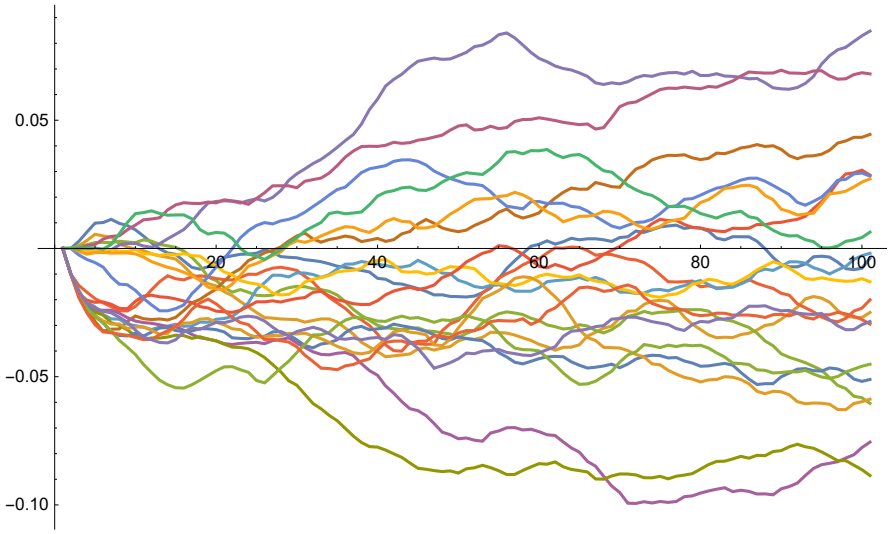
```
Time tot = 1.       1/gam = 0.0308642       Temp = 0.555556          alpha = 0.137174
```



```
ncoll = 20;
sig = 3;
m = .25; b = 8.1;
ep = 0.01; nstep = 100;
Print["Time tot = ", nstep * ep, "        1/gam = ", m / b,
 "        Temp = ", .5 sig^2 / b, "          alpha = ", (sig / b)^2]

LangevinColl = Table[rantab = RandomVariate[NormalDistribution[0, sig], nstep + 1];
    RecurrenceTable[
     {x[n + 2] == (2 - b ep / m) x[n + 1] + (b ep / m - 1) x[n] + rantab[[n + 1]] ep^2 / m, x[0] ==
       0, x[1] == ep * RandomInteger[-1, 1]}, x, {n, 0, nstep}], {i, ncoll}] // Quiet;
ListPlot[LangevinColl, Joined → True]
```

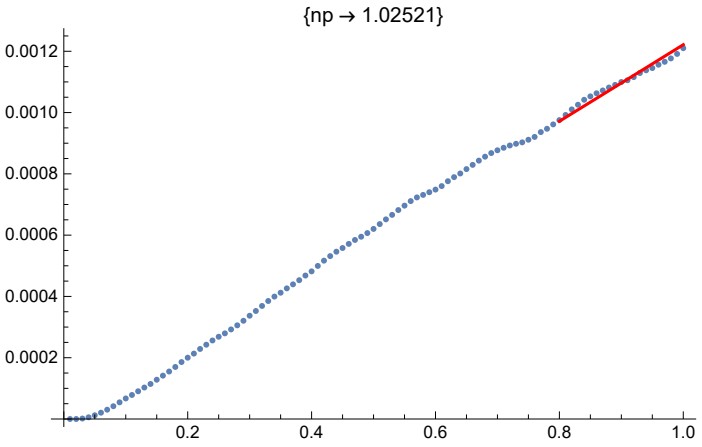
```
Time tot = 1.        1/gam = 0.0308642        Temp = 0.555556          alpha = 0.137174
```



```
ncoll = 1000; sig = 3;
m = .25; b = 8.1;
ep = 0.01; nstep = 100;
Print["Time tot = ", nstep * ep, "        1/gam = ", m / b,
 "        Temp = ", .5 sig^2 / b, "          alpha = ", (sig / b)^2]

LangevinColl = Table[rantab = RandomVariate[NormalDistribution[0, sig], nstep + 1];
    RecurrenceTable[{x[n + 2] == (2 - b ep / m) x[n + 1] + (b ep / m - 1) x[n] + rantab[[n + 1]]
        ep^2 / m, x[0] == 0, x[1] == 0}, x, {n, 0, nstep}], {i, ncoll}] // Quiet;
varxp2[n_] := Sum[(LangevinColl[[i]][[n]])^2, {i, ncoll}] / ncoll -
   (Sum[LangevinColl[[i]][[n]], {i, ncoll}] / ncoll)^2;
L2tab = Table[{n ep, varxp2[n]}, {n, nstep}];
tx2xd2 = Table[L2tab[[ii]], {ii, 4 nstep / 5, nstep}];
fit = FindFit[tx2xd2, (sig / b)^2 (n ep)^np, {np}, n];
Show[ListPlot[L2tab], Plot[((sig / b)^2 (n ep)^np) /. fit,
  {n, ep 4 nstep / 5, ep nstep}, PlotStyle → Red], PlotLabel → fit]
```

```
Time tot = 1.        1/gam = 0.0308642        Temp = 0.555556          alpha = 0.137174
```



```
ncoll = 500; sig = 3;
m = .25; b = 8.1;
ep = 0.01; nstep = 100;
Print["Time tot = ", nstep * ep, "        1/gam = ", m / b,
 "        Temp = ", .5 sig^2 / b, "          alpha = ", (sig / b)^2]

Table[LangevinColl = Table[rantab = RandomVariate[NormalDistribution[0, sig], nstep + 1];
    RecurrenceTable[{x[n + 2] == (2 - b ep / m) x[n + 1] + (b ep / m - 1) x[n] + rantab[[n + 1]]
        ep^2 / m, x[0] == 0, x[1] == 0}, x, {n, 0, nstep}], {i, ncoll}] // Quiet;
 varxp2[n_] := Sum[(LangevinColl[[i]][[n]])^2, {i, ncoll}] / ncoll -
   (Sum[LangevinColl[[i]][[n]], {i, ncoll}] / ncoll)^2;
 L2tab = Table[{n ep, varxp2[n]}, {n, nstep}];
 tx2xd2 = Table[L2tab[[ii]], {ii, 4 nstep / 5, nstep}];
 fit = FindFit[tx2xd2, (sig / b)^2 (n ep)^np, {np}, n];
 Show[ListPlot[L2tab], Plot[((sig / b)^2 (n ep)^np) /. fit,
   {n, ep 4 nstep / 5, ep nstep}, PlotStyle → Red], PlotLabel → fit], {5}]
```

```
Time tot = 1.        1/gam = 0.0308642        Temp = 0.555556          alpha = 0.137174
```