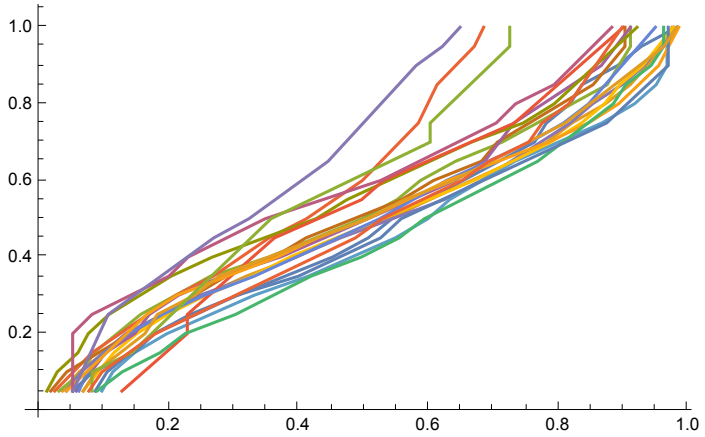
In[163]:=
```
ListPlot[Table[fitwaves[[i]], {i, 20}], Joined → True]
```

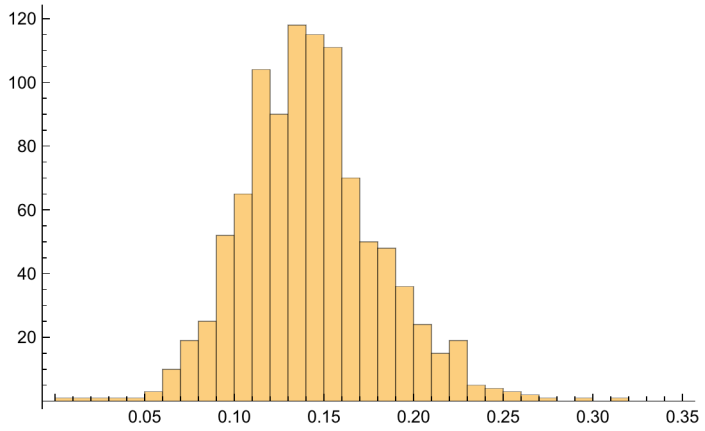
Out[163]=



In[293]:=
```
cf = ConstantArray[0, {nevents, 4}];
Do[
  model = a + b * t + c * t^2;
  fit = FindFit[fitwaves[[i]], model, {a, b, c}, t];
  modelf = Function[{t}, Evaluate[model /. fit]];
  cf[[i, 1]] = modelf[0.05];
  cf[[i, 2]] = modelf[0.1];
  cf[[i, 3]] = modelf[0.15];
  cf[[i, 4]] = modelf[0.9];
  , {i, nevents}];
```

In[295]:=
```
tdiff = (cf[[All, 1]] + cf[[All, 2]] + cf[[All, 3]]) / 3;
Histogram[tdiff, {0.00, 0.35, .01}]
```

Out[296]=

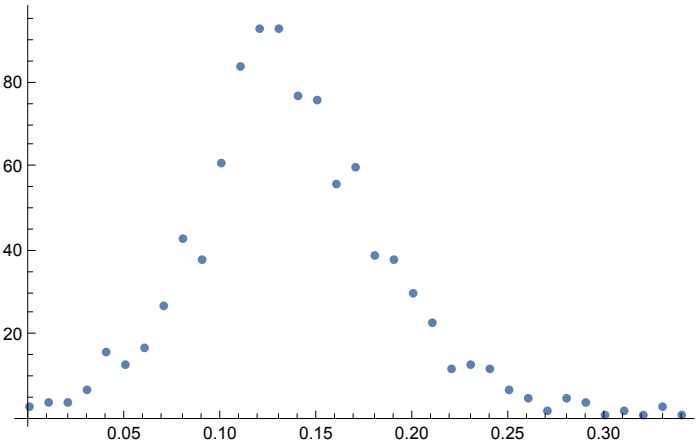


In[297]:=
```
b2 = BinCounts[tdiff, {0.00, 0.35, .01}];
Dimensions[b2]
```

Out[298]= {35}

In[299]:=
```
ListPlot[bc2]
```

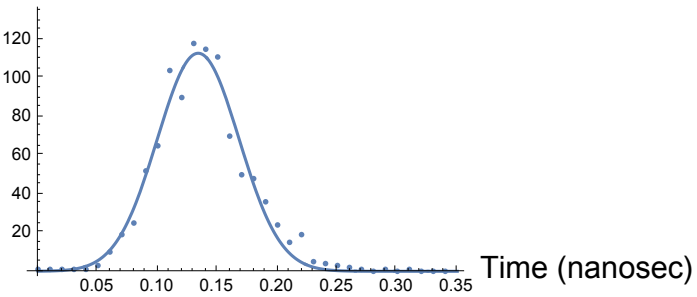
Out[299]=



In[300]:=
```
v = 0.00 + .01 * (Range[35] - 1);
vp2 = v[[Position[b2, Max[b2]][[1, 1]]]];
bc2 = Transpose[{v, b2}];
ff = FindFit[bc2, amp2 * s2 * PDF[NormalDistribution[m2, s2], x],
   {amp2, {s2, 0.033}, {m2, .12}}, x];
fittedcurve = amp2 * s2 * PDF[NormalDistribution[m2, s2], x] /. ff;
```

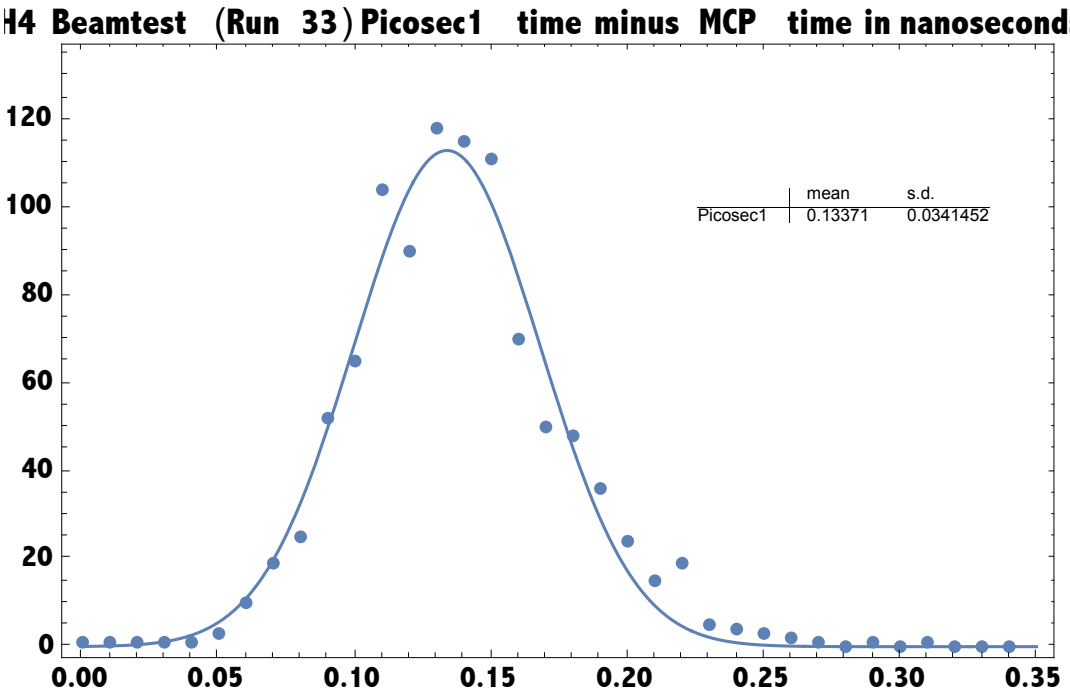
In[310]:=
```
pt = TableForm[{{m2, s2}} /. ff,
   TableHeadings → {{"Picosec1"}, {"mean", "s.d."}}];
slpp = Show[ListPlot[bc2, AxesLabel → {"Time (nanosec)", ""}],
  Plot[fittedcurve, {x, 0.00, 0.35}],
  PlotRange → {{0.0, 0.35}, {0, 130}}, AxesOrigin → {0, 0}]
```

Out[311]=



In[312]:=
```
Show[slpp, Graphics[Inset[Column[{pt}], {.28, 100}]], ImageSize → Large,
 Frame → True, FrameLabel → {{None, None}, {None, None}}, PlotLabel →
  HoldForm[H4 Beamtest (Run 33) Picosec1 time minus MCP time in nanoseconds],
 LabelStyle → {FontFamily → "Abadi MT Condensed Extra Bold", 16, GrayLevel[0]}]
```

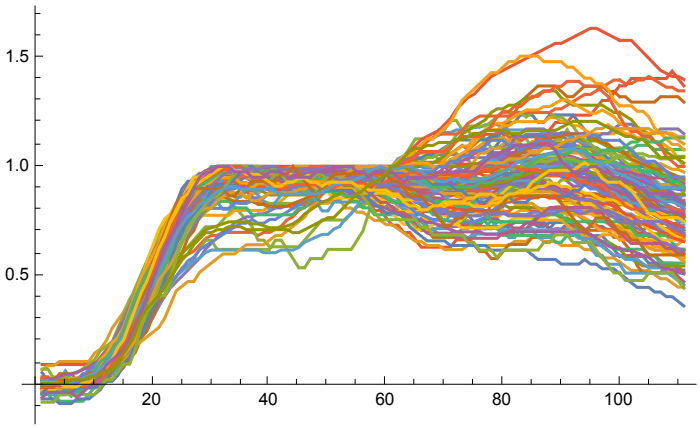
Out[312]=



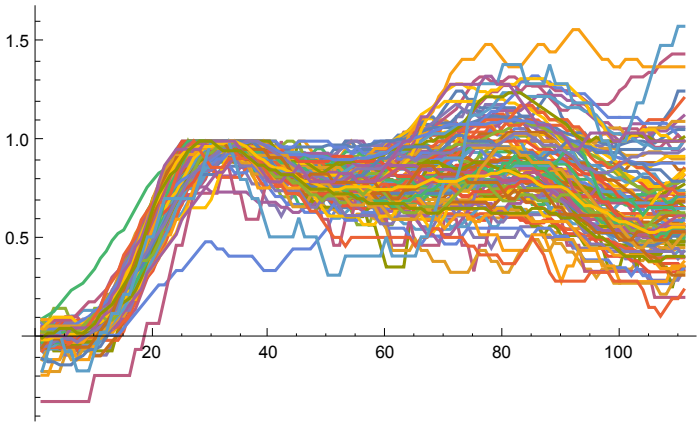
Look at Picosec2

In[203]:=
```
firstpeak2 =
  Table[Max[Take[subps2[[i]], {nt0[[i]] + 50, nt0[[i]] + 110}]], {i, nevents}];
pswave2 = Table[Take[subps2[[i]], {nt0[[i]] + 50, nt0[[i]] + 160}] / firstpeak2[[i]],
   {i, nevents}];
ListPlot[Table[pswave[[i]], {i, 100}], Joined → True]
ListPlot[Table[pswave2[[i]], {i, 100}], Joined → True]
```

Out[205]=

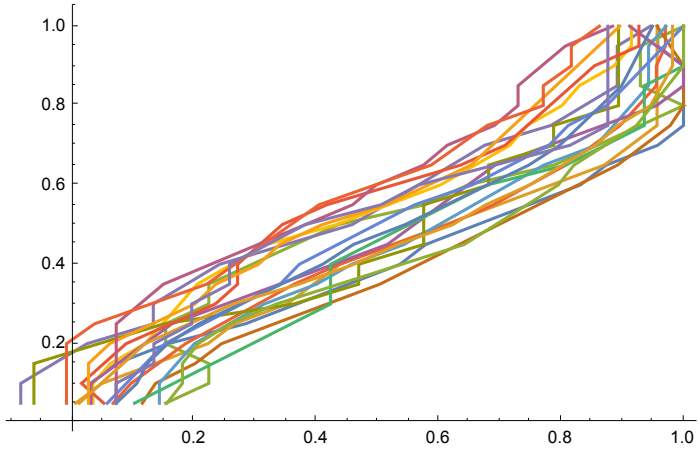


Out[206]=



In[207]:=
```
fitwaves2 =
  Table[Transpose[{Take[pswave2[[i]], {11, 30}], tbins}], {i, nevents}];
ListPlot[Table[fitwaves2[[i]], {i, 20}], Joined → True]
```

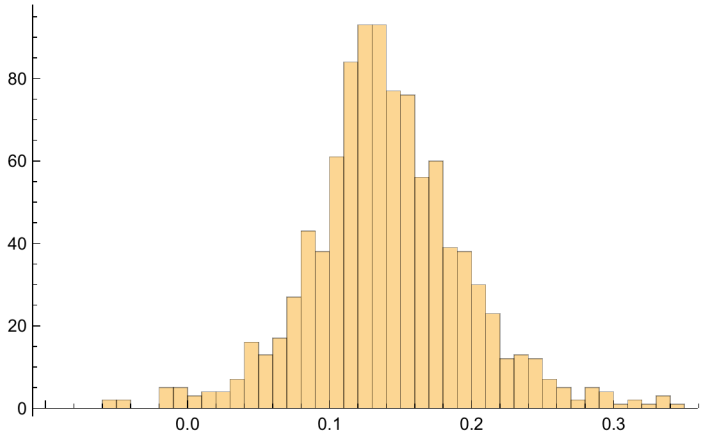
Out[208]=



In[272]:=
```
cf2 = ConstantArray[0, {nevents, 4}];
Do[
  model = a + b * t + c * t^2;
  fit = FindFit[fitwaves2[[i]], model, {a, b, c}, t];
  modelf = Function[{t}, Evaluate[model /. fit]];
  cf2[[i, 1]] = modelf[0.05];
  cf2[[i, 2]] = modelf[0.1];
  cf2[[i, 3]] = modelf[0.15];
  cf2[[i, 4]] = modelf[0.4];
  , {i, nevents}];
```

In[274]:=
```
tdiff = (cf2[[All, 1]] + cf2[[All, 2]] + cf2[[All, 3]]) / 3;
Histogram[{(*cf2[[All,1]],*)tdiff}, {-0.1, 0.35, .01}]
```

Out[275]=



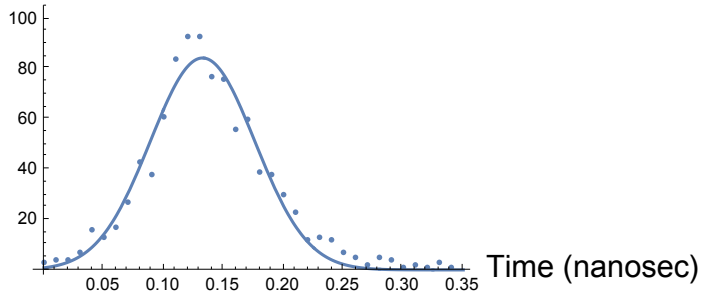
In[276]:=
```
b2 = BinCounts[tdiff, {0.00, 0.35, .01}];
Dimensions[b2]
```

Out[277]= {35}

In[278]:=
```
v = 0.00 + .01 * (Range[35] - 1);
vp2 = v[[Position[b2, Max[b2]][[1, 1]]]];
bc2 = Transpose[{v, b2}];
ff = FindFit[bc2, amp2 * s2 * PDF[NormalDistribution[m2, s2], x],
    {amp2, {s2, 0.033}, {m2, .12}}, x];
fittedcurve = amp2 * s2 * PDF[NormalDistribution[m2, s2], x] /. ff;
```

In[286]:=
```
pt = TableForm[{{m2, s2}} /. ff,
    TableHeadings → {{"Picosec1"}, {"mean", "s.d."}}];
slpp = Show[ListPlot[bc2, AxesLabel → {"Time (nanosec)", ""}],
  Plot[fittedcurve, {x, 0.00, 0.35}],
  PlotRange → {{0.0, 0.35}, {0, 100}}, AxesOrigin → {0, 0}]
```

Out[287]=



In[288]:=
```
Show[slpp, Graphics[Inset[Column[{pt}], {.28, 100}]], ImageSize → Large,
 Frame → True, FrameLabel → {{None, None}, {None, None}}, PlotLabel →
  HoldForm[H4 Beamtest (Run 33) Picosec2 time minus MCP time in nanoseconds],
 LabelStyle → {FontFamily → "Abadi MT Condensed Extra Bold", 16, GrayLevel[0]}]
```

Out[288]=