```
comptonSpectrumObs = Module[{alist = {0.5, 1, 1.5, 2}, sigma = .01, appearOpts},
   appearOpts = comptonSpectrumAppearance[alist];
   Plot[NIntegrate[
          comptonSectionByEnergy[#, e0] * PDF[
             NormalDistribution[e0, sigma]
           ][e],
          {e0, 0, 2 #^2 / (1 + 2 #)}
         ] & /@ alist // Simplify // Evaluate,
     {e, 0, Max[alist]},
     PlotRange → {0, 4.8},
     Evaluate[Sequence @@ appearOpts]
    ] // Quiet
  ];
exportPlot[comptonSpectrumObs]
```