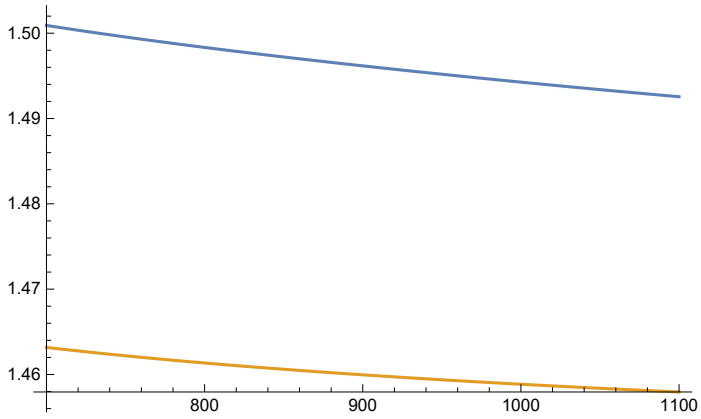
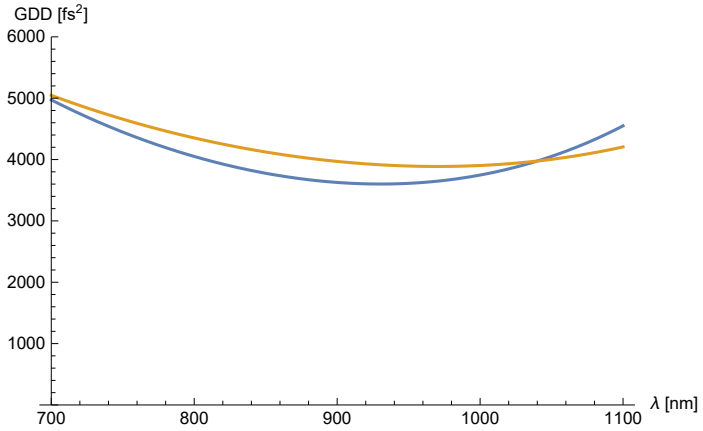
```
μm = 10^-6;
c = 299 792 458;
fs = 10^-15;
mm = 10^-3;
nm = 10^-9;

(*From QIOptiq internal comunication and also http://
 www.foctek.net/products/kdp_crystals.htm*)
no[λ_] := (1.9575544 + 0.2901391 (λ / μm)^2 / ((λ / μm)^2 - 0.0281399) - 0.02824391 (λ / μm)^2 + 0.004977826 (λ / μm)^4)^(1/2)
ne[λ_] := (1.5005779 + 0.6276034 (λ / μm)^2 / ((λ / μm)^2 - 0.0131558) - 0.01054063 (λ / μm)^2 + 0.002243821 (λ / μm)^4)^(1/2)

Plot[{no[λ nm], ne[λ nm]}, {λ, 700, 1100}]
```



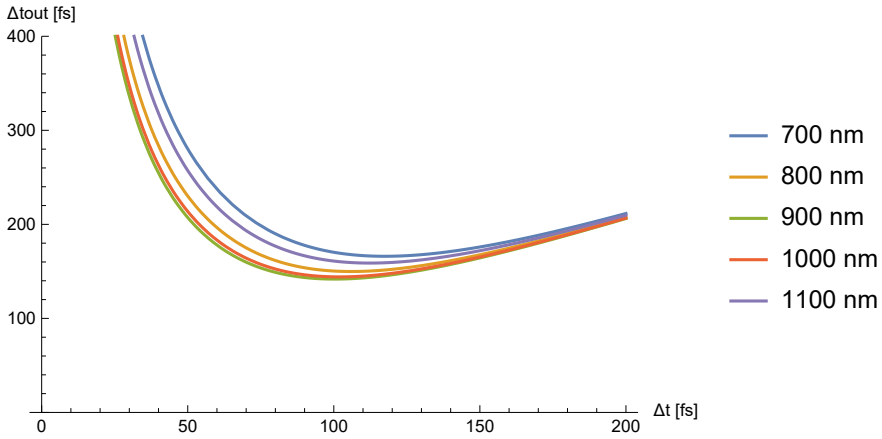

```
(*Group velocity dispersion (GVD). Ref: Young 2015 and Newport website*)
GVDo[λ_] := λ^3 no''[λ] / (2 π c^2)
GVDe[λ_] := λ^3 ne''[λ] / (2 π c^2)
(*Group delay dispersion
 (GDD = GVD*L, where L is the material thickness) vs wavelength*)
GDDo[L_, λ_] := L * GVDo[λ]
GDDe[L_, λ_] := L * GVDe[λ]
```

```
L = 112 mm;
Plot[{GDDo[L, λ nm] / fs^2, GDDe[L, λ nm] / fs^2}, {λ, 700, 1100},
 PlotRange → {0, 6000}, AxesLabel → {"λ [nm]", "GDD [fs^2]"}]
```



$$\Delta\text{tout}[\Delta t\_, \text{GDD}\_] := \frac{\sqrt{\Delta t^4 + 16\,\text{Log}[2]^2\,\text{GDD}^2}}{\Delta t}$$ (*Gaussian pulse broadening*)

```
(*Ref: Eq8 in http://www.newport.com/The-Effect-
  of-Dispersion-on-Ultrashort-Pulses/602091/1033/content.aspx*)

(*output pulsewidth vs input pulsewidth, gaussian pulses*)
Plot[Evaluate[Table[Δtout[Δt fs, GDDo[L, λ nm]] / fs, {λ, 700, 1100, 100}]],
 {Δt, 0, 200}, PlotRange → {0, 400}, AxesLabel → {"Δt [fs]", "Δtout [fs]"},
 PlotLegends → {"700 nm", "800 nm", "900 nm", "1000 nm", "1100 nm"}]
```




```
Δtout[150 fs, GDDo[L, 750 nm]] / fs
```

171.047