

# GVD parameter $\beta_2$ from the dispersion parameter D

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The following code, generates the GVD parameter  $\beta_2$  from the dispersion parameter D.

$$\beta_2 = -\frac{\lambda^2}{2\pi c} D$$

The input variable "Disp" represents dispersion parameter D and is in units of ps/nm/km.

The input variable "InLambda" represents the wavelength and is in units of nm.

The output  $\beta_2$  is in units of ns<sup>2</sup>/km.

```
Beta2FromDispersion[Disp_, InLambda_] := Module[{outBeta2},
  clight = 299 792 458.;
  Inwavelength = InLambda * 10-9;
  DispersionParameter = Disp  $\frac{10^{-12}}{10^{-9} * 10^3}$  (*change from ps/nm/km to s/m/m *);
  outBeta2 = -  $\frac{\text{Inwavelength}^2}{2 \pi \text{clight}}$  DispersionParameter  $\frac{10^9 * 10^9}{10^{-3}}$ 
  (*change from s2/m to ns2/km *);
  outBeta2
];
```

In the following example, we assume that the D parameter is 16.94 ps/nm/km at 1550 nm.

```
Beta2FromDispersion[16.94, 1550]
-0.0000216061
```