

## Cavity Ringdown Calculations

$R_L$  = the ratio of the absorber length to the geometric length of the cavity

$N_{ref}$  = reference molecular density (taken at a standard temperature  $T$  and pressure  $P$ )

$c$  = speed of light

$M$  = molecular density as a function of temperature and pressure

$\tau'$  = ringdown time constants corrected for Rayleigh scattering

$$\tau' = \left( \frac{1}{\tau} - \sigma_{air} \times (M - N_{ref}) \times c \right)^{-1} \quad (1)$$

$$\sigma = \frac{R_L}{c} \left( \frac{1}{\tau'} - \frac{1}{\tau'_0} \right) \quad (2)$$