$ro := roO2 \cdot \frac{kg}{m^3}$

$roO2 := 1.225$

$vol := 1 \cdot m^3$

$volmass := ro \cdot vol \rightarrow kg \cdot roO2$

$molarMassO2 := 32 \ \frac{gm}{mol}$

$molMass := molarMassO2$

$Nmol := \frac{volmass}{molMass} = 38.281 \ mol$

$Npt := Nmol \cdot N_A = 2.305 \cdot 10^{25}$ count of particles in 1M3 giver RO

$pszO := 0.299 \cdot 10^{-12} \ m$

$psz := pszO$

$lw := 600 \ nm$

$lwCells := \frac{m}{lw}$ count of Light cells per 1m

$lwCellsM3 := lwCells^3$ count of Light cells in 1m3

$ptCellPerLcell := \left(\frac{lw}{psz}\right)^3 = 8.081 \cdot 10^{18}$ count of particle cells in light cell. per volume

$cellsM3 := \left(\frac{1 \cdot m}{psz}\right)^3 = 3.741 \cdot 10^{37}$ count of particle cells in 1m3

$$PptM3 := \frac{Npt}{cellsM3} = 6.162 \cdot 10^{-13}$$

probability to encounter particle in one particle cell per m3

$$PptLc := PptM3 \cdot ptCellPerLcell = 4.98 \cdot 10^{6}$$

probability to encounter particle in one Light Cell

$$P\_m := PptLc \cdot lwCells = 8.299 \cdot 10^{12}$$

probability for light wave to encounter particles over 1m

$$P\_km := P\_m \cdot 1000 = 8.299 \cdot 10^{15}$$

probability for light wave to encounter particles over 1km

$$trk := 1$$

$$Ttrk := 1 - \frac{psz}{lw} \cdot trk \rightarrow -1.0 \cdot \frac{0.4983333333333333333 \cdot 10^{-15} \cdot m}{nm} + 1.0$$

$$ProbPerDist(dist) := P\_km \cdot dist$$

$$Ttrk^{ProbPerDist(1000)} \rightarrow \left(-1.0 \cdot \frac{0.4983333333333333333 \cdot 10^{-15} \cdot m}{nm} + 1.0\right)^{8299262734875000000} = 0$$