L9MINPOWS **Calculation of minimum power for a laser model**

Induced absorption of level 3 must be larger than spontanious emission from state 2

$N := 10^{25} \cdot m^{-3}$ $\lambda := .5 \cdot 10^{-6} \cdot m$ $h := 7 \cdot 10^{-34} \cdot W \cdot s^2$ $c := 3 \cdot 10^8 \cdot \frac{m}{s}$

1. Assuming metastable state for 2

$$A21 := .3 \cdot 10^3 \cdot \frac{1}{s}$$

$P := N \cdot A21 \cdot h \cdot \frac{c}{\lambda}$ $P = 1.26 \times 10^9 \, kg \, m^{-1} \, s^{-3}$

$kg \cdot \frac{m^2}{s^2} = joule$ $\frac{joule}{s} = Watt$

P is $1.26 \cdot 10^9 \ \frac{Watt}{m^3}$ or $1.26 \cdot 10^3 \ \frac{Watt}{cm^3}$

2. Assuming spontaneous emission for state 2

$$AA21 := .3 \cdot 10^8$$

$PP(AA21) := N \cdot AA21 \cdot h \cdot \frac{c}{\lambda}$

$PP(AA21) = 1.26 \times 10^{14} \, kg \, m^{-1} \, s^{-2}$ or $1.26 \cdot 10^8 \ \frac{Watt}{cm^3}$