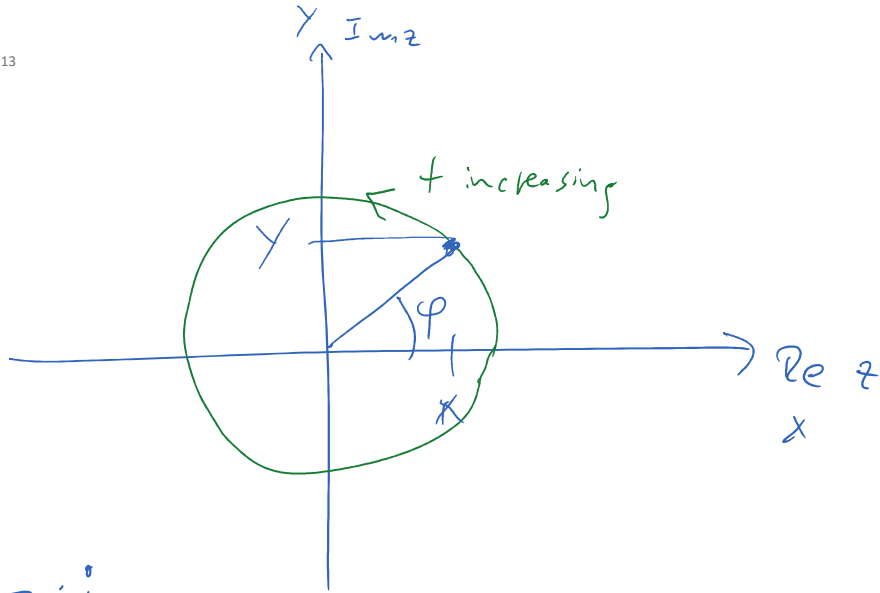


$$e^{i\omega t}$$



$$\sqrt{-1} =: i$$

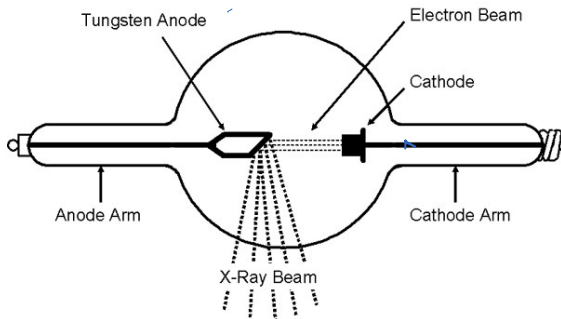
$$z = x + iy$$

$$z = e^{i\varphi} = \cos\varphi + i\sin\varphi$$

Oscillation : $z(t) = A \cdot e^{i\omega t}$

$$\omega t = \varphi(t)$$

Frequency $2\pi \times 1\text{MHz}$



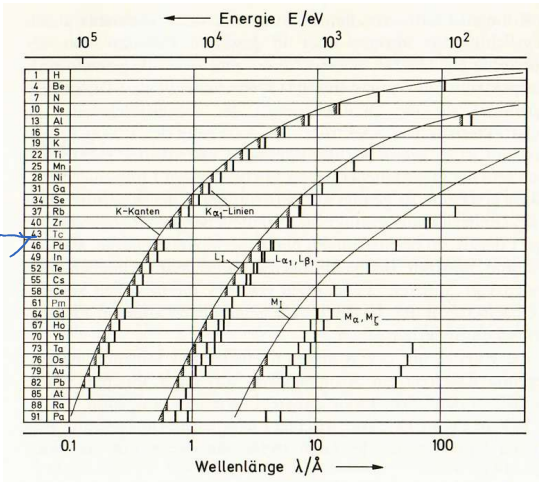
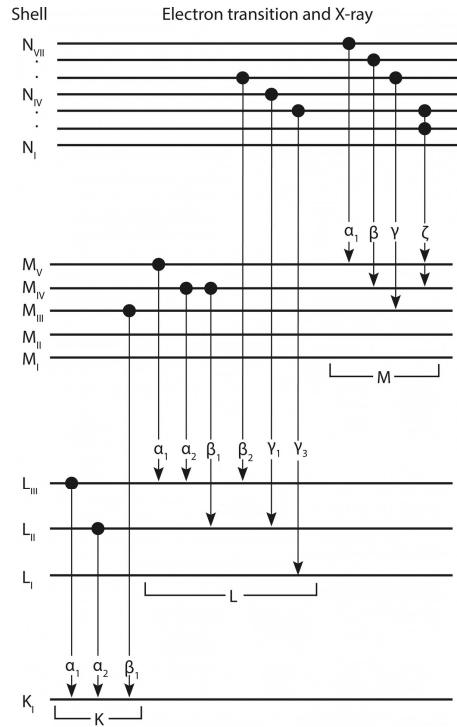


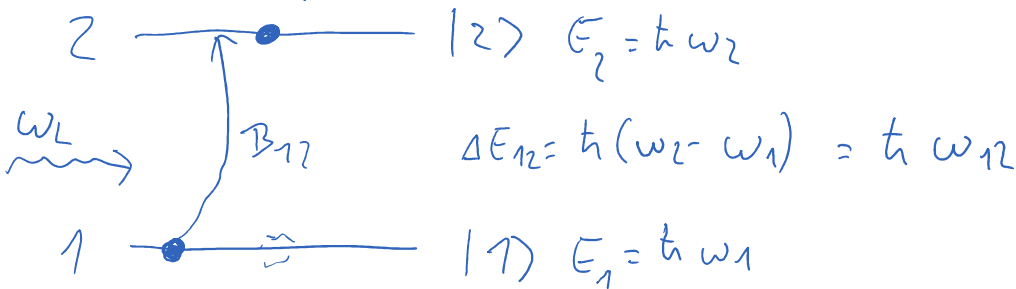
Abb. 18.8. Moseley-Diagramm der Absorptionskanten. Für die Kantenfrequenzen $\bar{\nu}$ gilt $\sqrt{\bar{\nu}/R} = (Z - s)/n$, wobei s die Abschirmungszahl ist, vgl. (18.3). n und s sind für die verschiedenen Schalen verschieden, deshalb sind die gemessenen Moseley-Geraden nicht parallel. Die Geraden der Spinduletts, z.B. $L_{II,III}$, vgl. Abschn. 18.5, laufen nach oben auseinander, weil die Spin-Bahn-Kopplung mit Z zunimmt. [Aus K.H. Hellwege: *Einführung in die Physik der Atome*, Heidelberger Taschenbücher, Bd. 2, 4. Aufl. (Springer, Berlin, Heidelberg, New York 1974) Abb. 72]



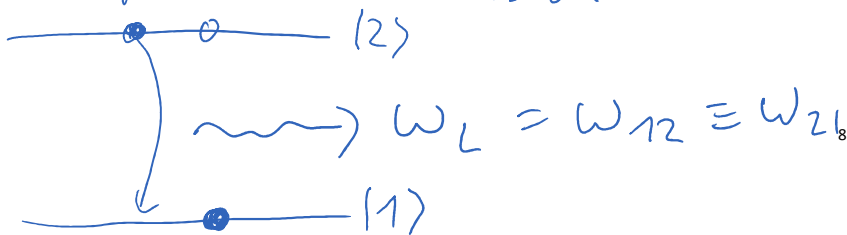
$$\frac{1}{\lambda} = 2\infty \left\{ \frac{(Z - \sigma_u)^2}{n^2} - \frac{(Z - \sigma_l)^2}{2^2} \right\} \quad (1.21)$$

$$K \rightarrow 1 \quad L \rightarrow 2$$

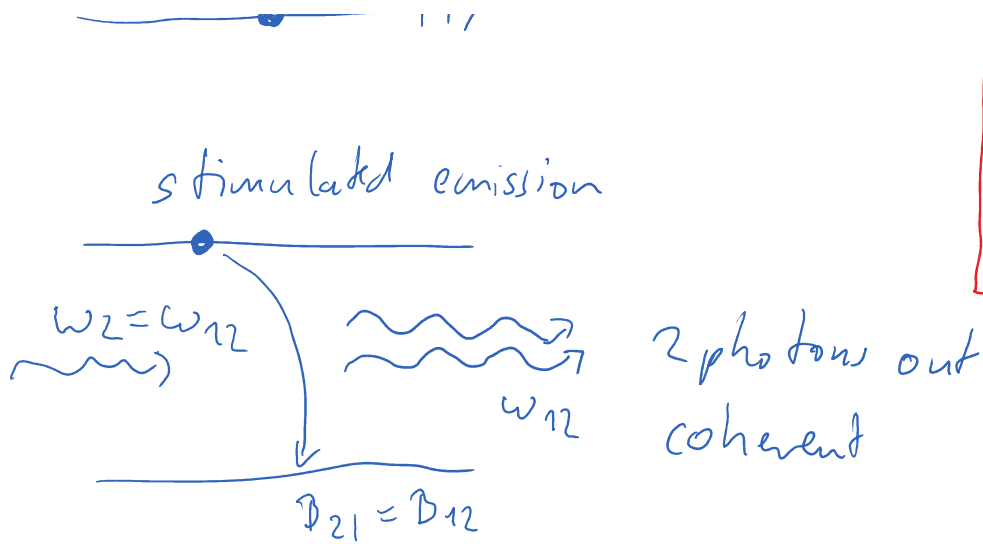
absorption



Spontaneous emission

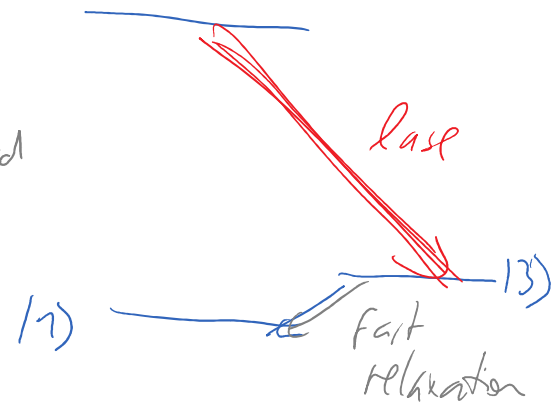
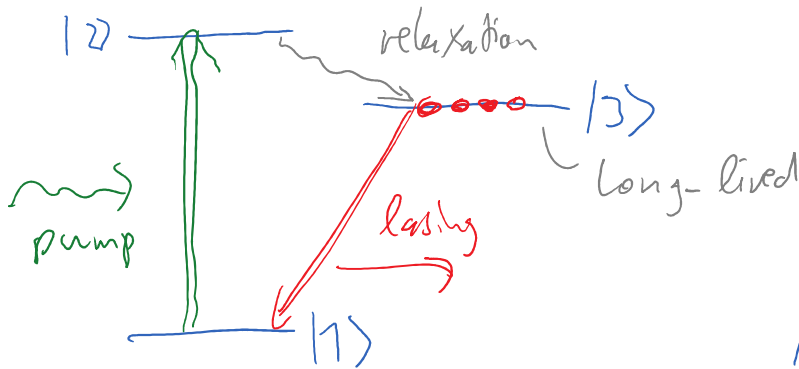


Light Amplification by Stimulated Emission of Radiation



Amplification by Stimulated Emission of Radiation

Real laser : ≥ 3 levels



Exercises

Mo	10-11	04-422
Tues	14-15	04-516
Thu	10-11	KPH
Wed	17-18	Lorenzraum