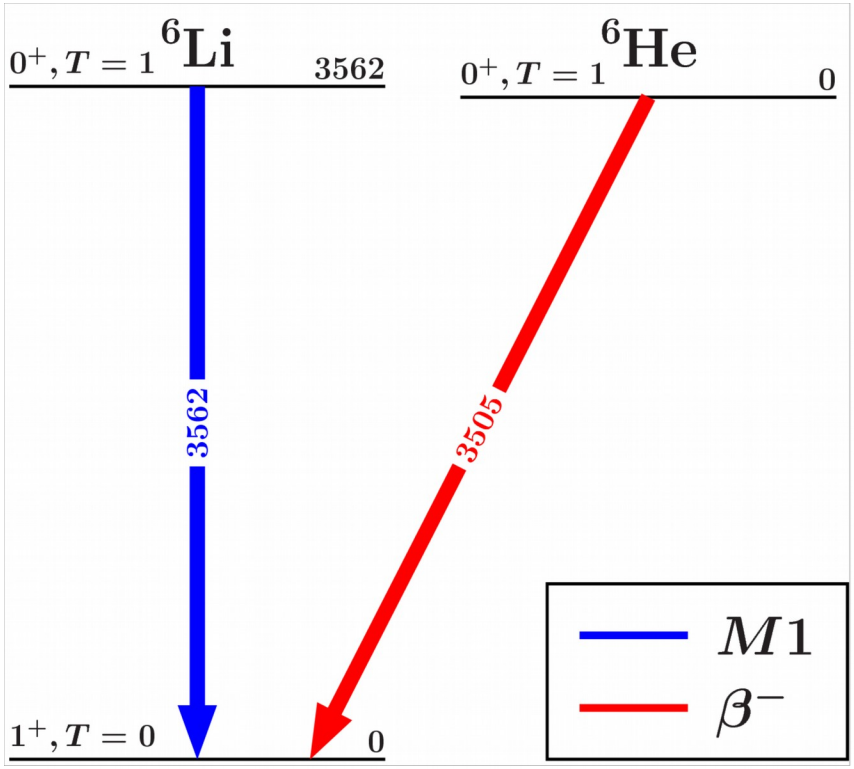
A01 – Relative Self Absorption

Marcel Schilling

TECHNISCHE UNIVERSITÄT DARMSTADT



Nuclear Resonance Fluorescence SFB 1245

Relative Self Absorption – ^{6}Li

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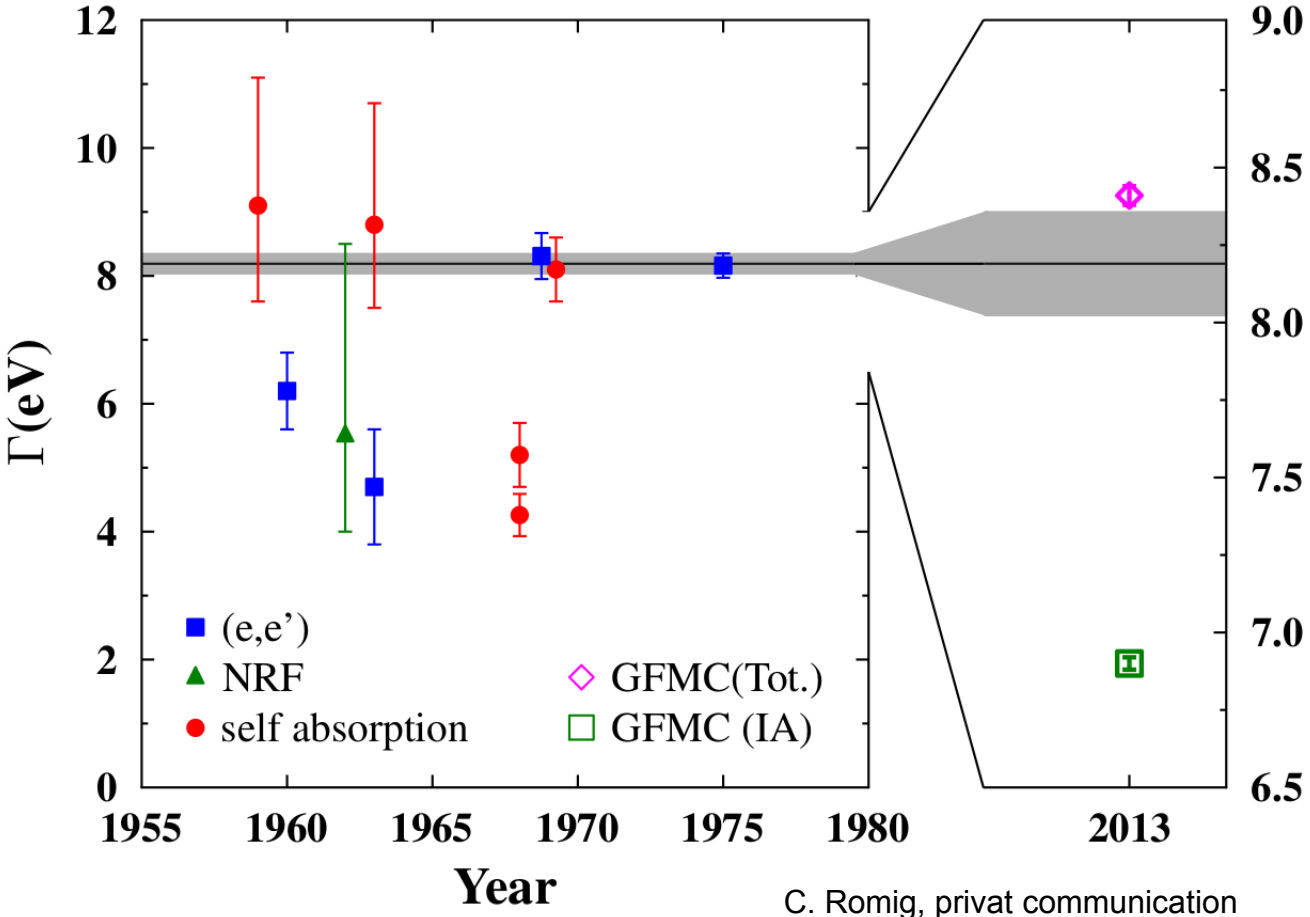
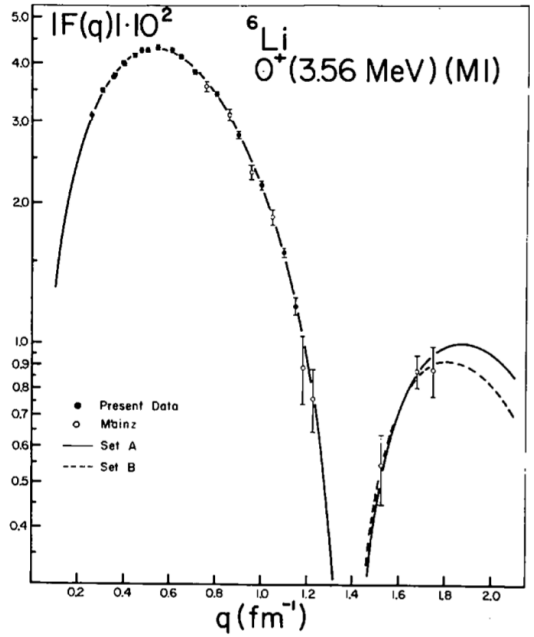


C. Romig, privat communication

□◇ S. Pastore et al.,Phys. Rev. C 87



J. C. Bergstrom et al. Nucl. Phys. A251

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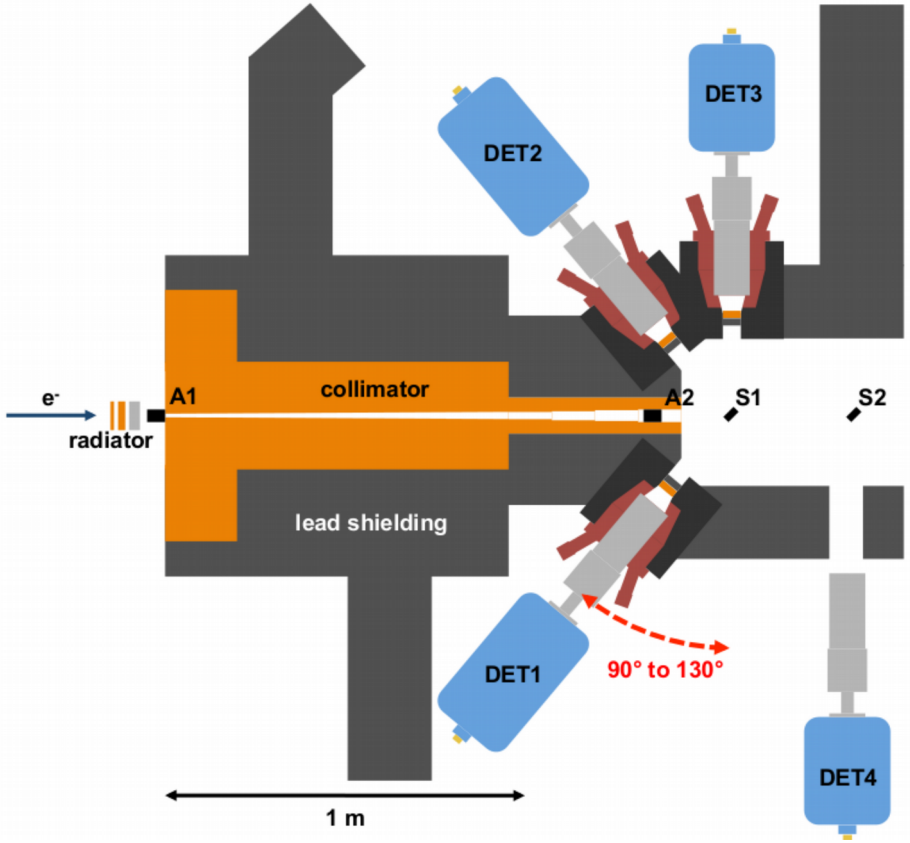
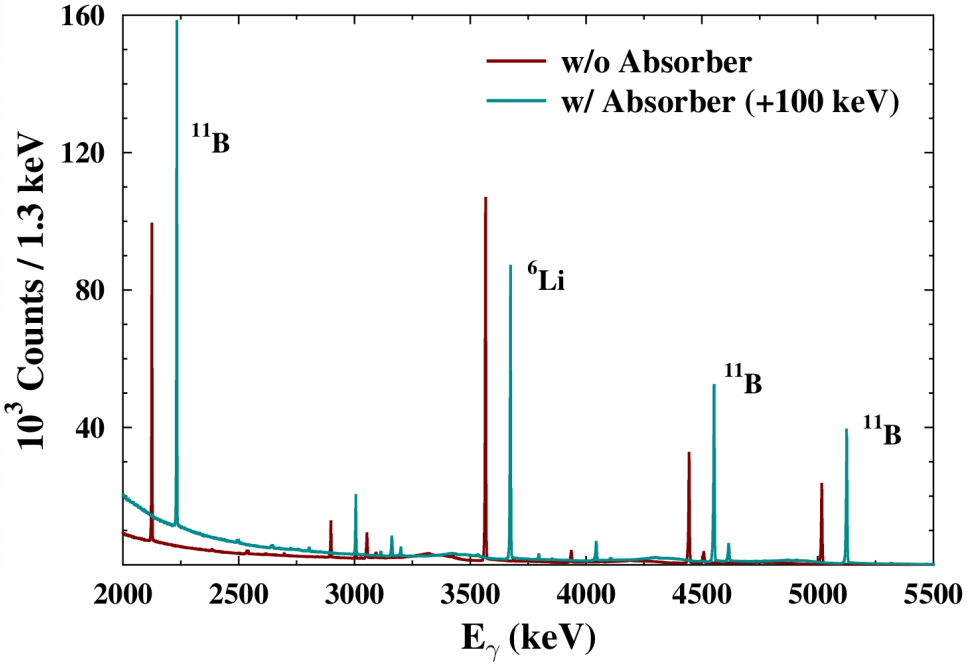




C. Romig, diss.

Relative Self Absorption – ^{6}Li

$$\Gamma \sim \sigma \sim \Delta \sim T$$

Γ: transition width σ: cross section Δ: Doppler width T: temperature

- T_{eff} takes vibrational degrees of freedom into account
  - ➔ Conventional approach

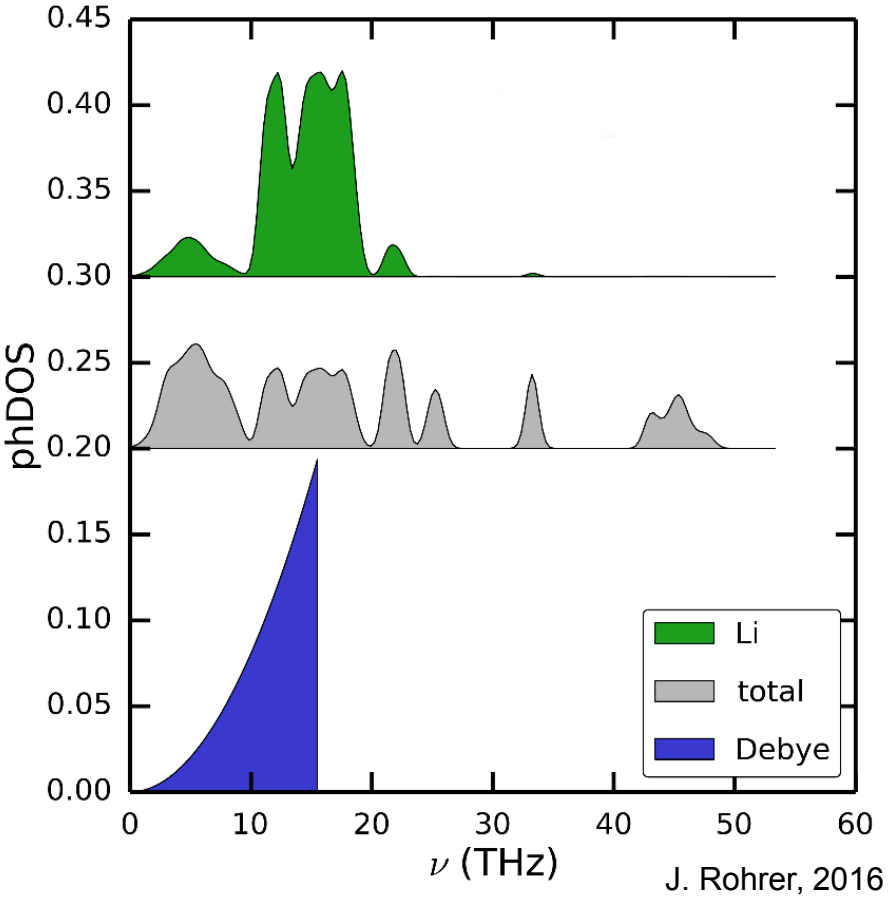
$$T_{eff} = 3T\left(\frac{T}{\theta_D}\right)^3 \int dx\, x^3 \left(\frac{1}{e^x - 1} + \frac{1}{2}\right)$$

- Calculations done by Prof. Albe and Dr. Rohrer

Relative Self Absorption – ^{6}Li
Calculation of T_{eff}

$$T_{eff} = 3T\left(\frac{T}{\theta_D}\right)^3 \int dx\, x^3 \left(\frac{1}{e^x - 1} + \frac{1}{2}\right)$$

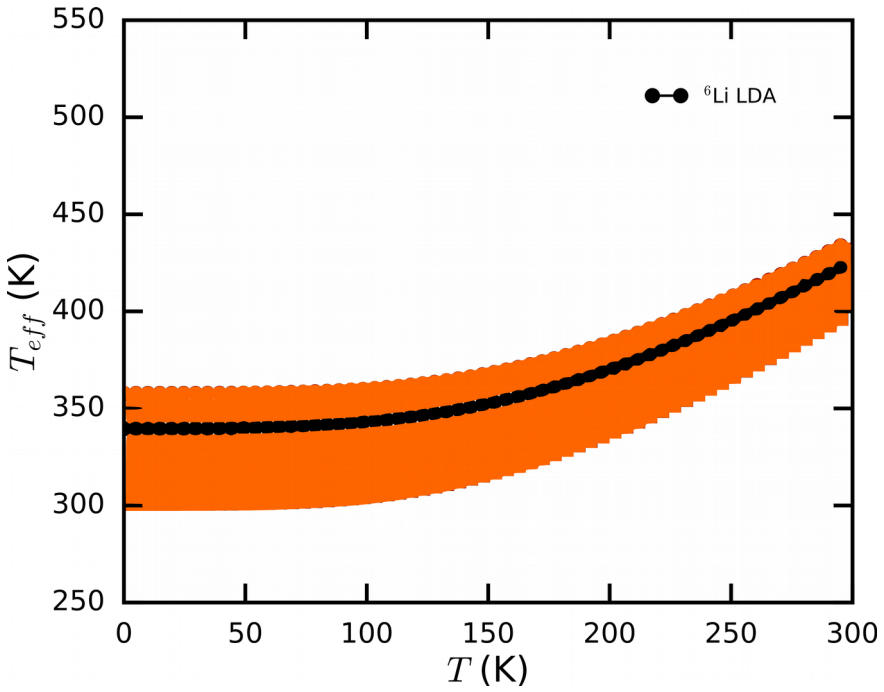
- Debye - Theory
  - ➔ Not necessarily applicable
- Use Phonon Density Func.



J. Rohrer, 2016

Relative Self Absorption – ^{6}Li

Calculation of T_{eff}



J. Rohrer, 2016

$$\Gamma_{LDA} = (8.28\ ^{+\ 0.091}_{-\ 0.096})\ \text{eV}$$

LDA: Local Density Approximation