Background free, non-linear Mößbauer spectroscopy without detector dead time

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NEXTSTEB

Nuclear **E**xcitation by **X**-ray **T**wo-color **S**ignal **T**hrough inverse **E**lectron **B**ridging

$$\frac{dN}{dt} \;=\; N_0 \Phi_x \sigma_{\text{NEXTSTEB}} \;=\; \frac{10^{-2}\ \text{Mößbauer photons}}{s \cdot \text{layer}}$$

for $\begin{cases} \text{focal } \varnothing\text{: 1μm,} \\ \text{bandwidth: } \leq 10 \text{ eV} \\ 10^{11} \text{ photons/pulse} \end{cases}$

Alternative: nonlinear, two color excitation of E2 Mößbauer transition

focused 7.2 keV pulse

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Mößbauer 14.4 keV

$^{57}Fe_2O_3$ sample

I = 3/2 (-)

I = 1/2 (-)

$\hbar\omega_i = 7.2$ keV

$\hbar\omega_f = 14.4$ keV