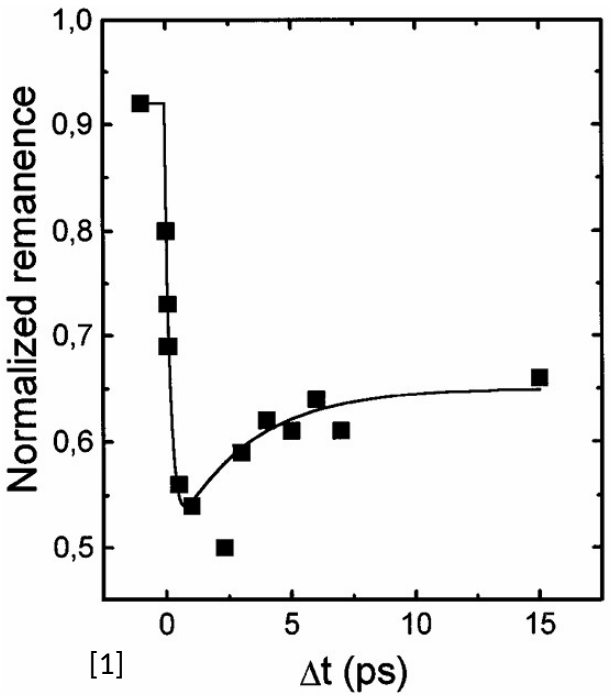
Element selective femtosecond magnetization dynamics of Co/Pt multilayers and alloys

Lola Chamot

Supervisors: Emmanuelle Jal, Boris Vodungbo and Nicolas Jaouen

Motivation



[1]

What happens at the microscopic level during the demagnetization?

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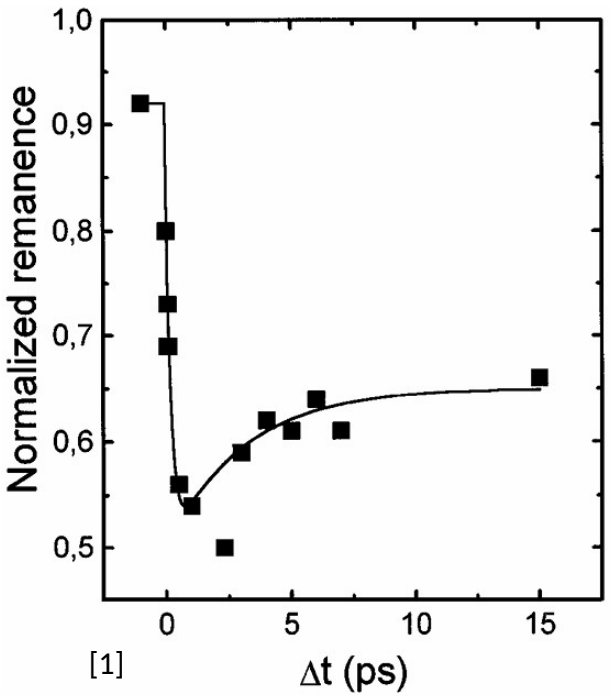

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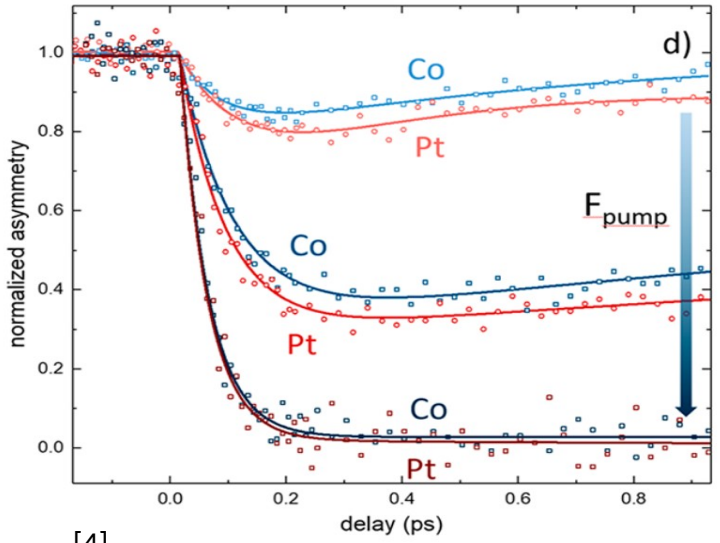

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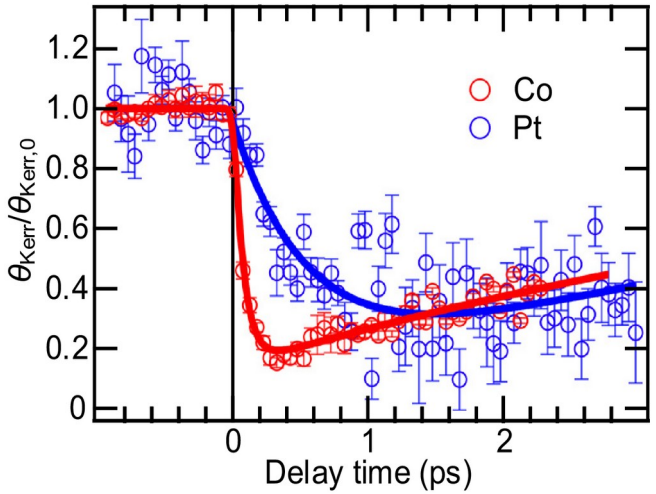
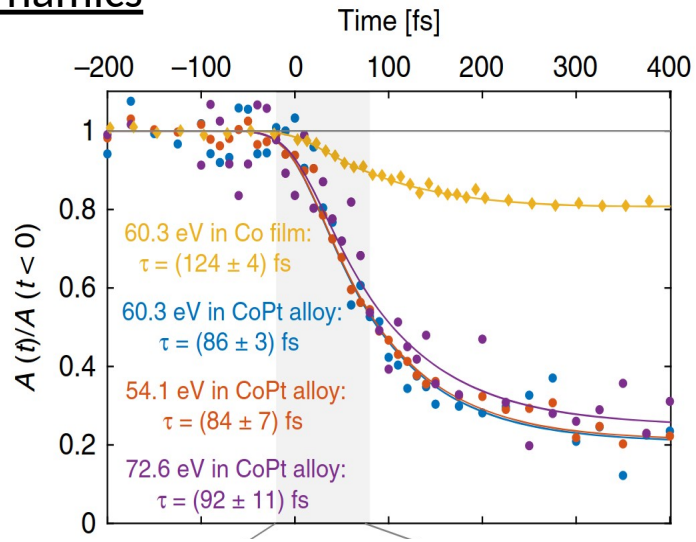


[3]

Equal dynamics



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Why is it difficult to find a consensus?

- Different demagnetization behaviour

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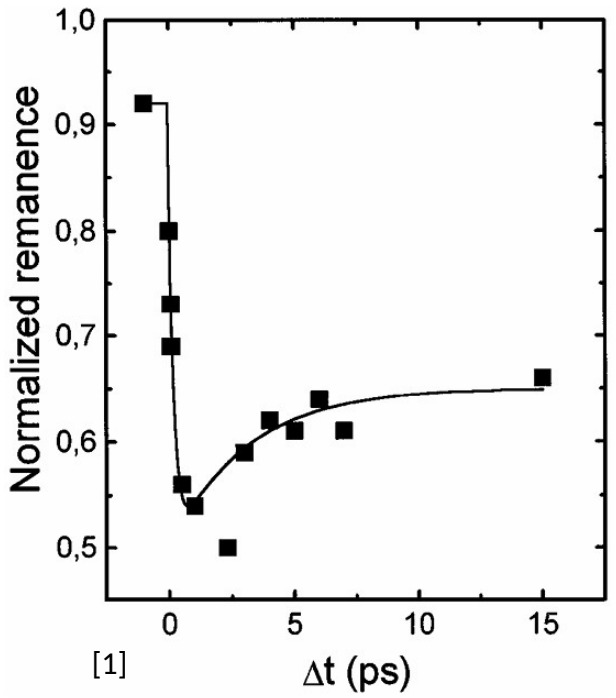

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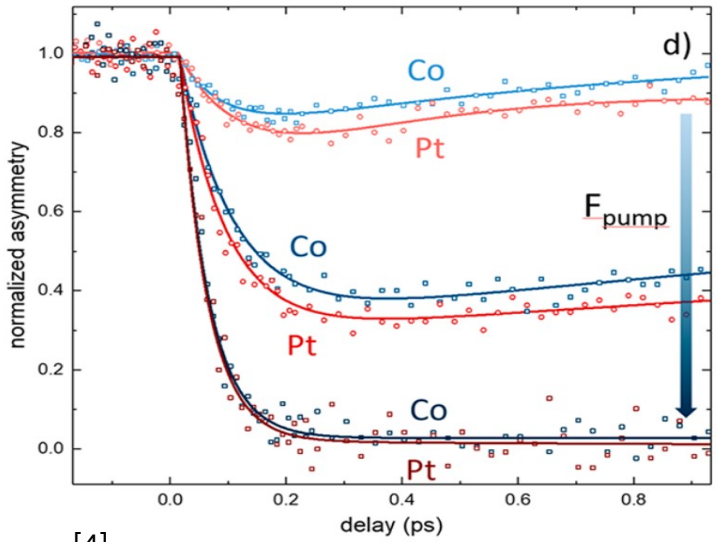
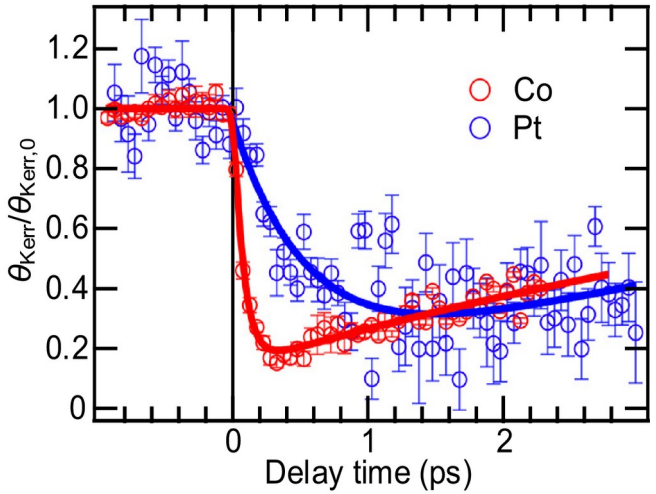


[4]

$Co_{70}Pt_{30}$



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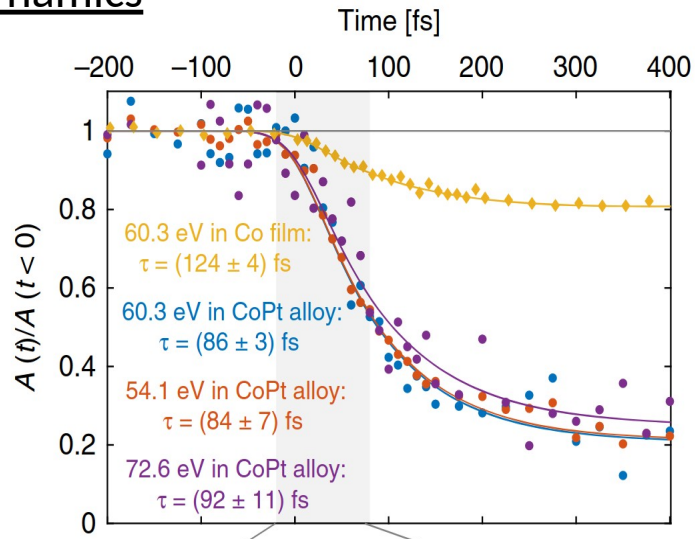
$[Co_{0.4nm}Pt_{0.7nm}]x3$

Equal dynamics



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$Co_{50}Pt_{50}$

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- Different demagnetization behaviour
- Different samples probed
- Use different probe techniques

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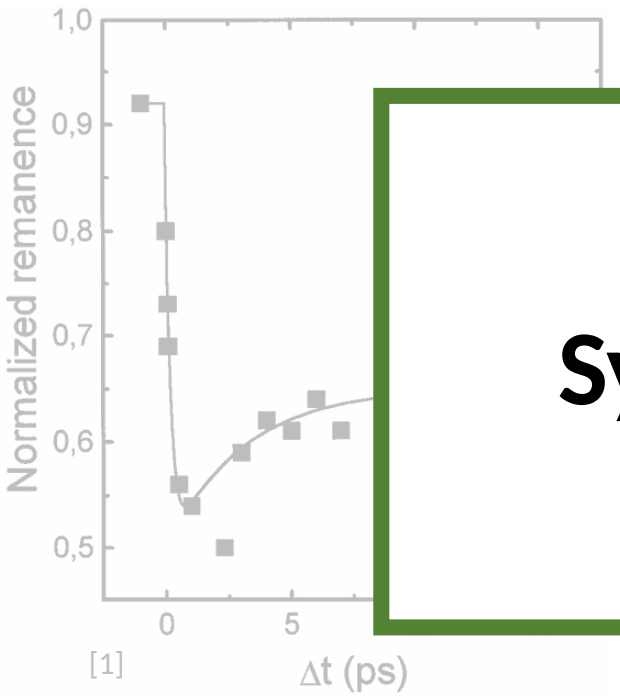

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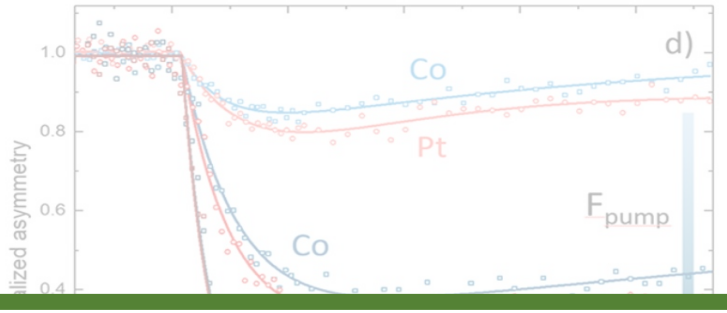
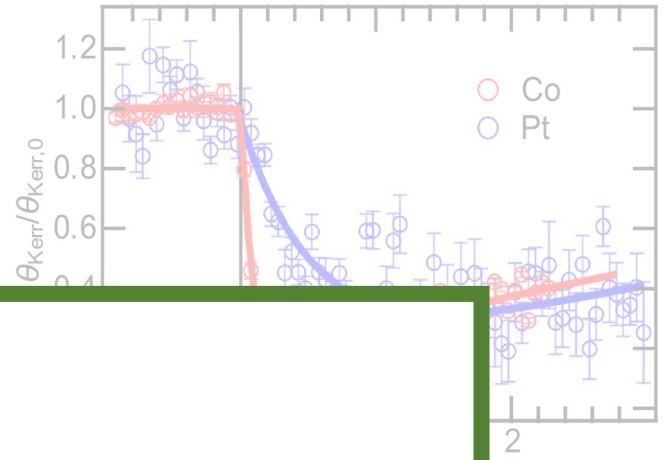
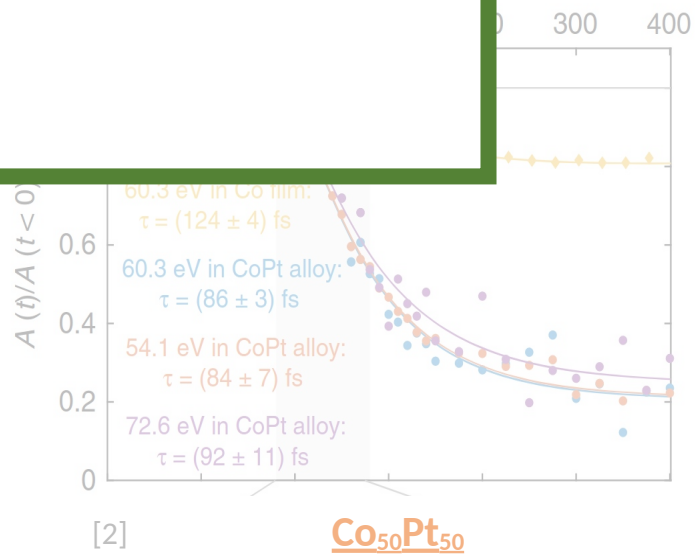




x3

Systematic study of Co/Pt system

- Different demagnetization behaviour
- Different samples probed
- Use different probe techniques



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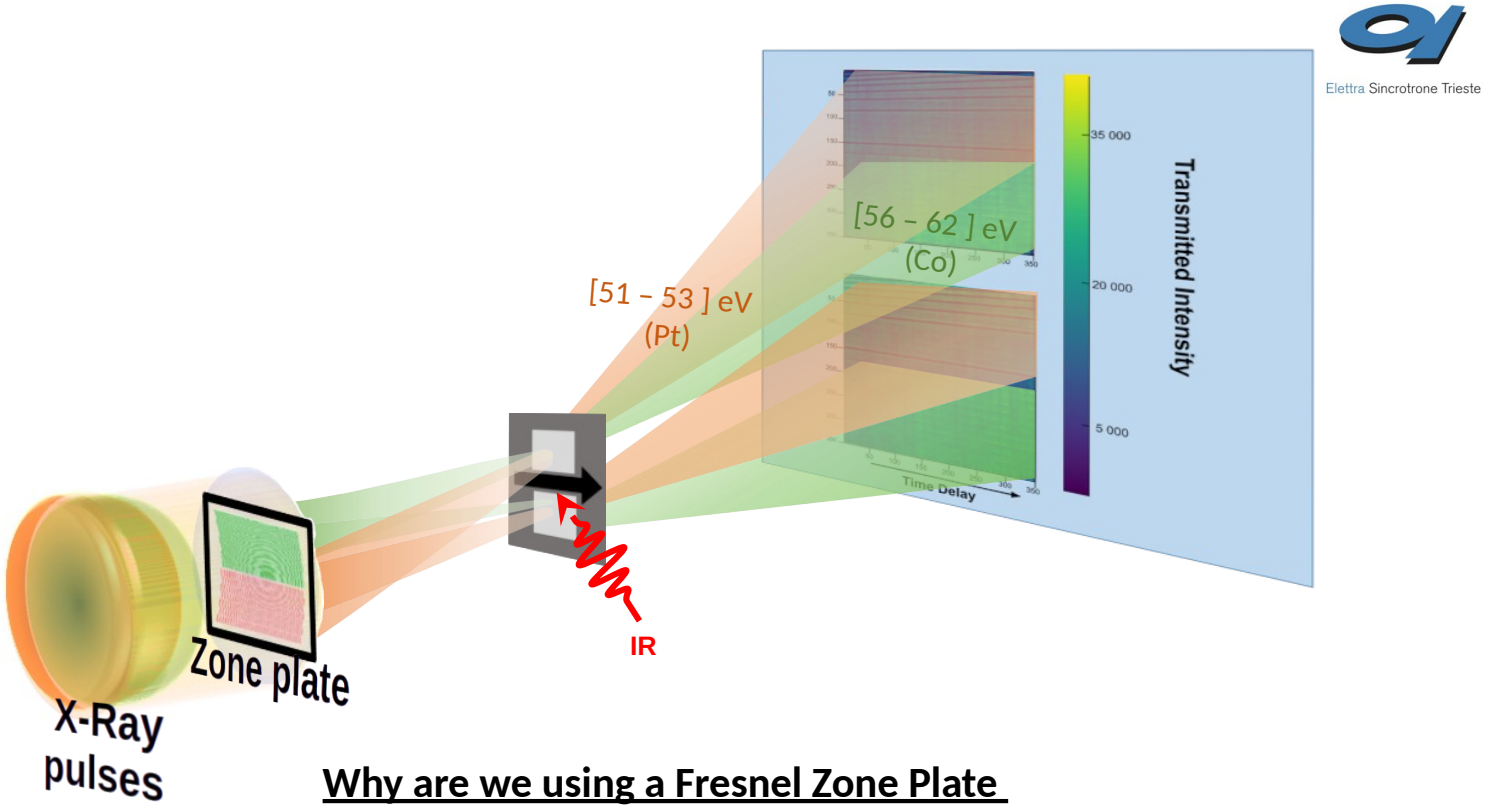
Pump probe X-Ray Magnetic Circular Dichroism



Why are we using a Fresnel Zone Plate

- All delays with one pulse
- Simultaneously probe two elements at different wavelengths

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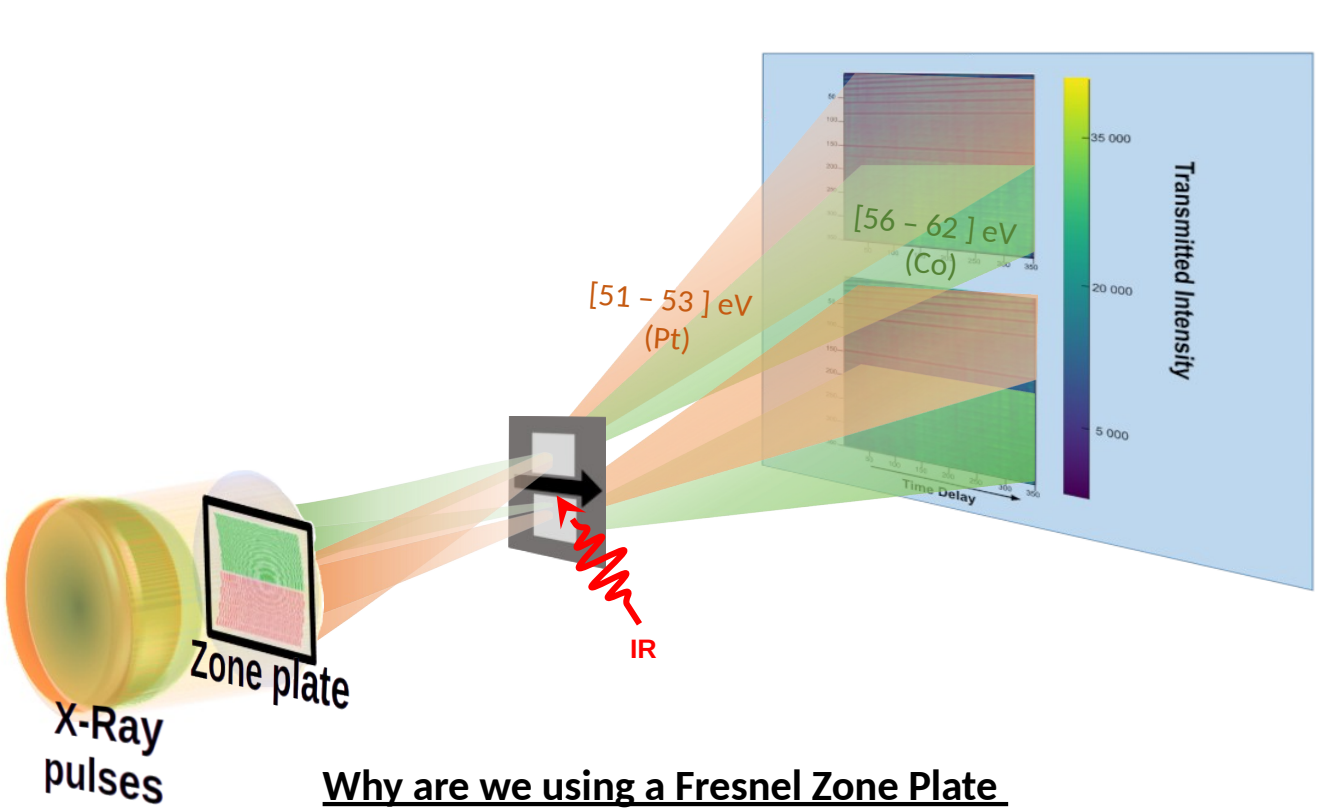
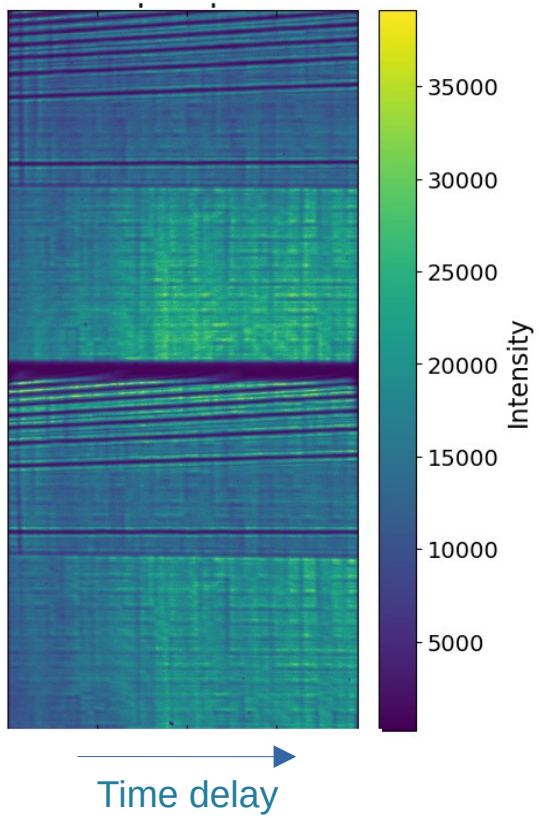


Elettra Sincrotrone Trieste

Raw data



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What can we obtain with this experimental set-up ?

- Demagnetization curve
- Spin dynamics during demagnetization
- Charge dynamics during dynamics

Thank you for your attention