



Electro-optical diagnostics

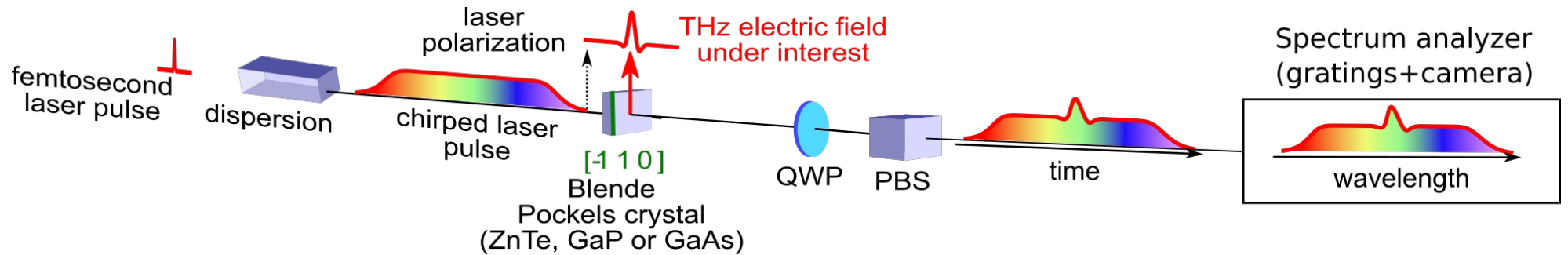
Time-stretch electro-optic using low bandwidth ADCs and 1550 nm lasers: first tests at SOLEIL

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11th Workshop on Longitudinal Electron Bunch Diagnostics
June 29, 2022

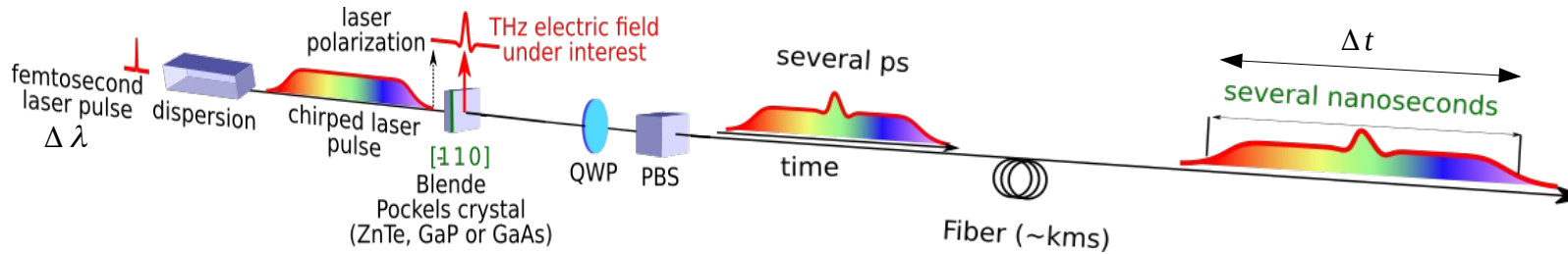
Ultrafast THz measurements

- Electro-optic sampling → Single-shot measurements



Photonic time-stretch

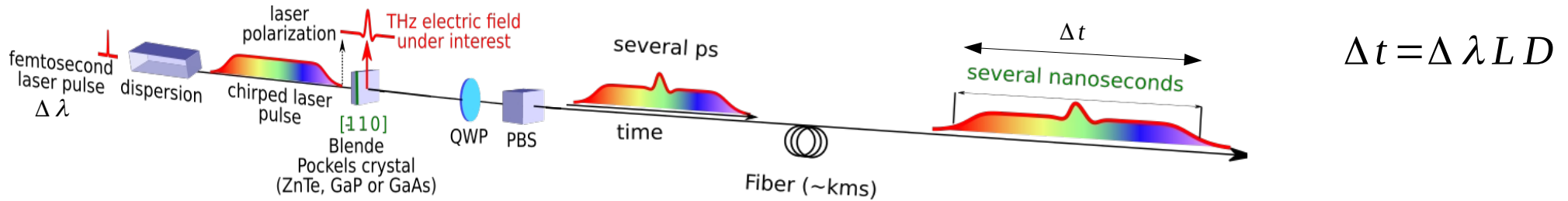
Achieve high repetition rates: Slowing down the signal before recording



$$\Delta t = \Delta \lambda L D$$

Photonic time-stretch

Achieve high repetition rates: Slowing down the signal before recording



Previous experiments were done at 1030 nm where the stretch was possible up to 6 ns

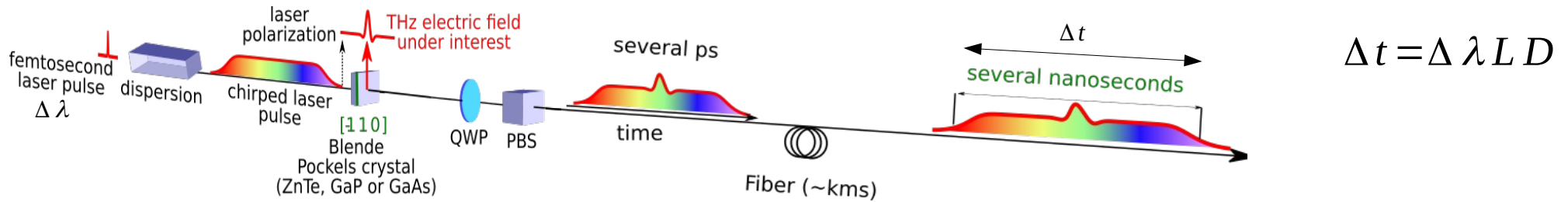
→ need of a fast and expensive oscilloscope with 20 GHz bandwidth

(price: 100 000 - 200 000 euros)

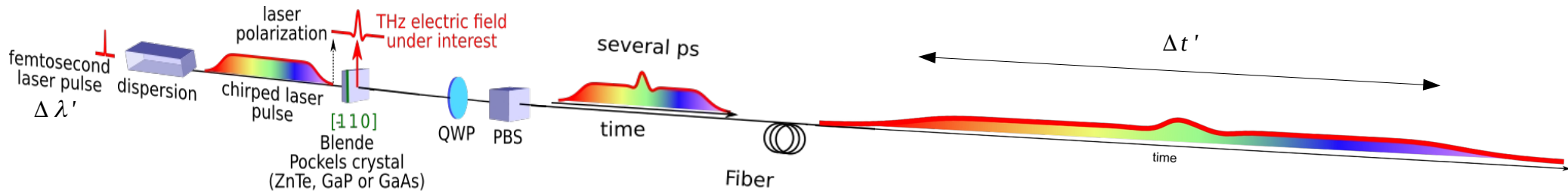
Another solution? **Stretch more?**

Photonic time-stretch

Achieve high repetition rates: Slowing down the signal before recording



How to stretch more??



Another laser wavelength: Time-stretch at 1550 nm

How to measure ultrafast coherent THz signals with a 3 GHz ADC board?

For more details, see poster “ Time-stretch electro-optic using low bandwidth ADCs and 1550 nm laser: first tests at SOLEIL”



See you there!