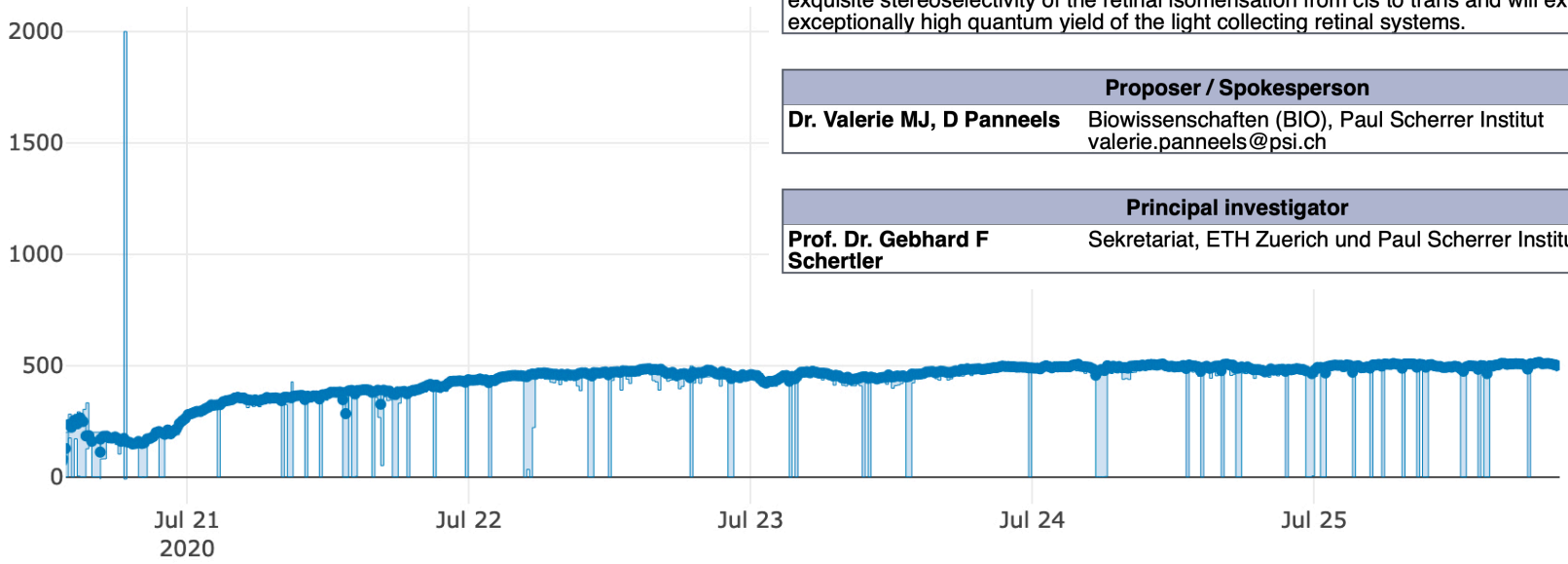
KW30 Photon Overview

30	Mon 20	MS	MS	MS	Milne C.
	Tue 21	AC	AE	AE	12 keV
	Wed 22	AE	AE	AE	Pannéels
	Thu 23	AE	AE	AE	Rhodopsin
	Fri 24	AE	AE	AE	
	Sat 25	AE	AC	MC	
	Sun 26	MC	MC	MC	

Week summary:

- *Requested*: 12 keV, 50 Hz, normal SASE spectrum, short pulse, >200 µJ
- *Delivered*: Machine very stable, constant increase in pulse energy, and reached a stable **500 µJ** mid-week

Big thanks to Simona, Florian and all the people who contributed to SwissFEL operation in the last three weeks !



Proposal 20200597

Title
The ultrafast time-resolved activation mechanism of visual pigments,prototypical G protein-coupled receptors.

Abstract
Mammalian rhodopsin is our receptor for vision, belonging to the large G protein-coupled receptor family. Upon photon absorption, the chromophore retinal in the rhodopsin binding pocket undergoes isomerisation from 11-cis to all-trans, one of the fastest processes in biology, triggered on a time-scale of femtoseconds. Our structural dynamics project on rhodopsin in the ultrafast regime using time-resolved pump-probe serial femtosecond crystallography with the brilliant and short X-ray pulses of the SwissFEL will illuminate the exquisite stereoselectivity of the retinal isomerisation from cis to trans and will explain the exceptionally high quantum yield of the light collecting retinal systems.

Proposer / Spokesperson	
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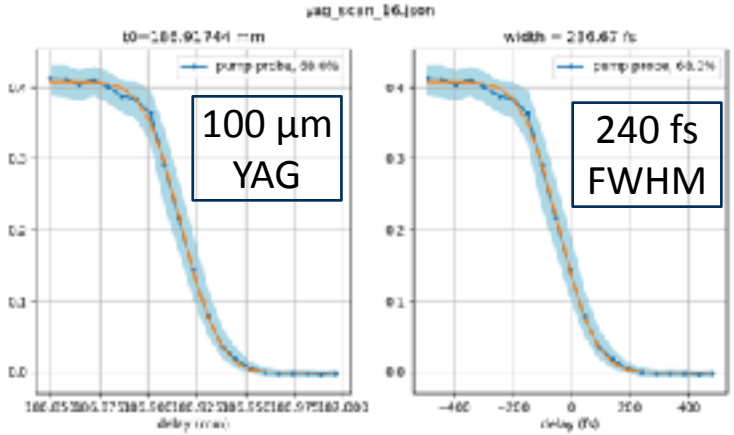
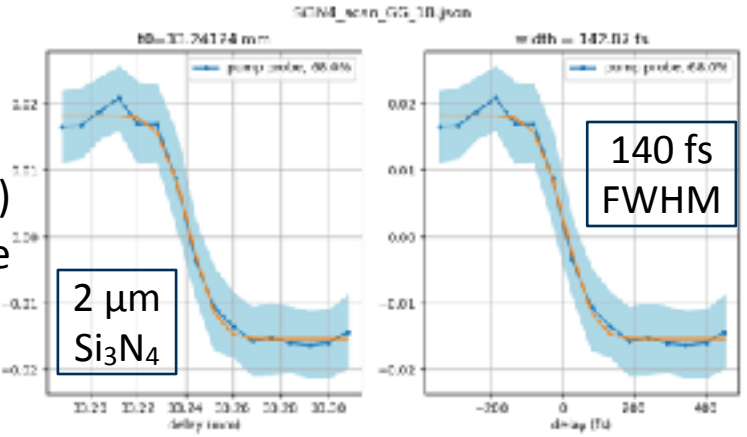
Principal investigator	
Prof. Dr. Gebhard F Schertler	Sekretariat, ETH Zuerich und Paul Scherrer Institut

Timing results: Confirmed shorter pulse

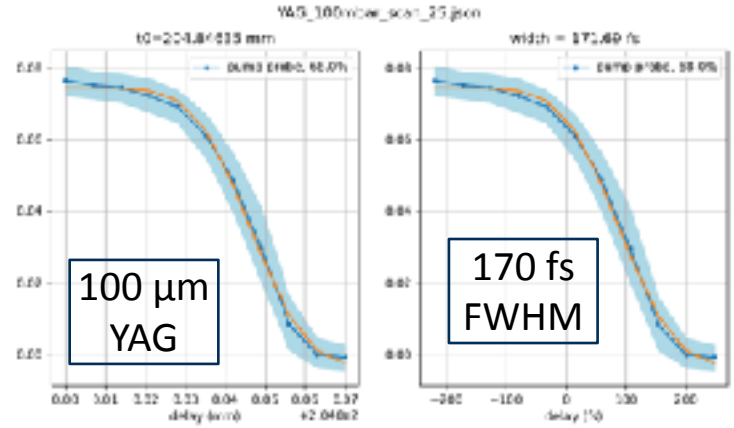
Phil & Chris
25.7.2020



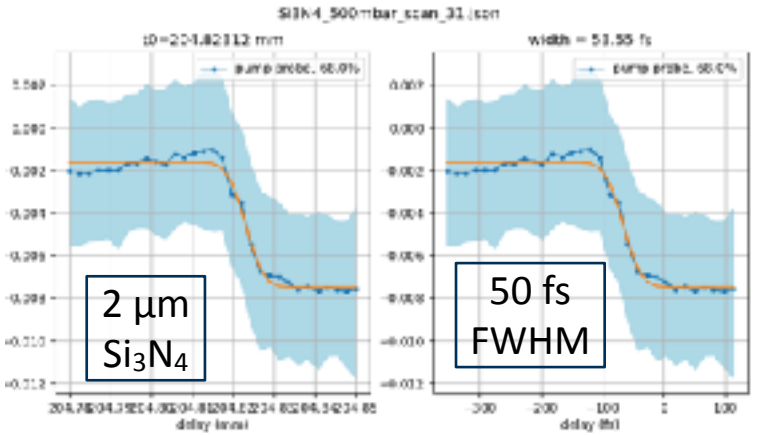
Pump-probe signal on YAG using 480 nm Topas (100 fs FWHM)
Consistently 240 fs FWHM signal rise time



Pump-probe signal on Si_3N_4 using 480 nm Topas (100 fs FWHM)
Consistently 140 fs FWHM signal rise time



Pump-probe signal on YAG using 800 nm (35 fs FWHM)
Changes from 240 fs to 170 fs



Pump-probe signal on Si_3N_4 using 800 nm (35 fs FWHM)

New ultrafast measurement record: 50 fs FWHM !