



Contribution ID: 48

Type: talk

## Interferometric stabilisation of pulse train generation and high repetition rate, high energy fibre laser development

*Wednesday, 16 September 2015 16:50 (20 minutes)*

We review recent experimental work carried out at Oxford University on laser technology for conventional and plasma wakefield accelerators. We demonstrate using a low power, inexpensive continuous wave laser to stabilise a double unbalanced Michelson interferometer. When a pulsed laser is injected into the interferometers a train of up to 4 pulses with freely controlled variable spacing and intensity produced, stabilised to less than one-twentieth of a wavelength. This technique can be transferred to higher power lasers to produce controlled pulse trains for multiple-pulse laser wakefield acceleration (MP-LWFA). We also report on progress towards high repetition rate (6.5MHz) fibre lasers for accelerator applications such as laserwire or driving photocathodes, including compression of high energy pulses in burst mode operation to near transform limited duration with excellent spatial mode quality and efficiency.

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**Session Classification:** WG7 - Laser technology for advanced accelerators

**Track Classification:** WG7 - Laser technology for advanced accelerators