European XFEL Science Seminar

Tuesday, 7th January 2020, 13:00
Campus Schenefeld, XHQ, room E1.173

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Purifying electron spectra from noisy pulses with machine learning using synthetic Hamilton matrices

We construct a fully connected feedforward artificial neural network to extract a purified electron spectrum corresponding to ionization with a Fourier limited light pulse from a noisy spectrum created by a short, noisy pulse.

The network is trained by theoretical spectra obtained from a large number of synthetically generated random Hamilton matrices coupled to short pulses and noise. Therefore, application to a wide variety of problems is possible.

Concrete first examples presented will include helium and H2+ for processes dominated by non-linear few-photon absorption in the XUV, where we demonstrate that indeed, the noise free spectrum can be uncovered with good accuracy.

Host: Johan Bielecki