



**31<sup>st</sup> January 2018 - 2:00 p.m.**  
 CFEL-bldg. 99, seminar room IV

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## Multiphoton multiple ionization dynamics of Xe atoms at ultrahigh hard X-ray intensity

In this talk, I report on two of our recent progresses. In the first part, I show the new ionization dynamics of Xe atoms at ultrahigh hard X-ray intensity found in a recent experimental work at LCLS. The experimental Xe charge state distribution (CSD) showed a peculiar oscillatory structure at 5.5keV. The structure becomes less outstanding at 6.5keV, and finally invisible at 8.3keV. Therefore, it strongly depends on photon energy. Our theoretical calculations clarified that the structure originates from resonant excitations between core orbitals. The significant relativistic energy corrections for Xe L-shell play a crucial role for the emergence of such resonant excitation channels. In the second part, I will show xcalib toolkit. xcalib calibrates the spatial intensity profile of a XFEL pulse at a focal spot using CSD of light atoms. This is required to calculate a focal averaging of theoretical result to compare it with experimental data. The calibration is essential to analyze and understand physics imprinted in experimental results. xcalib automates the calibration procedures which our group manually conducted in previous studies. Thus xcalib offers an efficient tool to handle massive amount of experimental results.

