Academy of Mathematics and Systems Science, CAS
Colloquia & Seminars

Speaker: 赵世舜 教授,吉林大学

Inviter:

Title: Calculation of high-order harmonic generation of atoms and molecules by combining time series prediction and neural networks

Time & Venue: 2022.11.17 15:10-16:00 腾讯会议：629-427-098

Abstract:

High-order harmonic generation (HHG) from the interaction of ultra-intense laser pulses with atoms is an important tabletop short-wave coherent light source. Accurate quantum simulations of it present large computational difficulties due to multi-electron multidimensional effects. In this paper, the time-dependent response of hydrogen atoms is calculated using a time-series prediction scheme, the HHG spectrum is reconstructed very accurately. The accuracy of the forecasting is further improved by using a neural network scheme. This scheme is also applied to the simulation of the harmonic emission on multi-electron systems, and the applicability of the scheme is confirmed by the harmonic calculation of complex systems. This method is expected to simulate the nonlinear dynamic process of multi-electron atoms and molecules irradiated by intense laser pulses quickly and accurately.

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