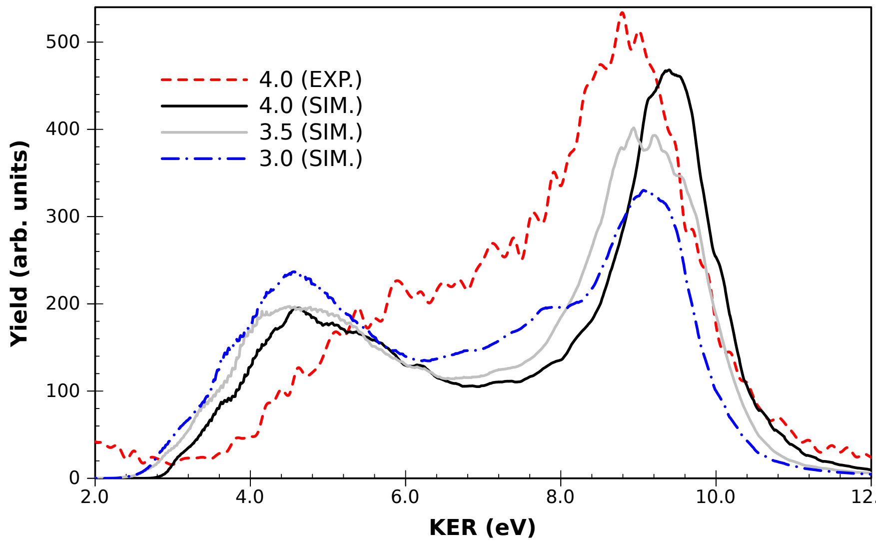

FIG. 2: Comparison of the experimental and simulation KER spectra. The red dotted line is related to the experimental results [3] for a 480 nm laser pulse with peak intensity I=4.0×10^{14} W cm^{-2} and $\sim$100$\pm$10 fs pulse duration. The black solid, grey solid, and blue dot-dash lines show simulation results for 480 nm, $\tau_p \simeq$40 fs laser pulses with peak intensities 4.0×10^{14}, 3.5×10^{14} ,and 3.0×10^{14} W cm^{-2} respectively.

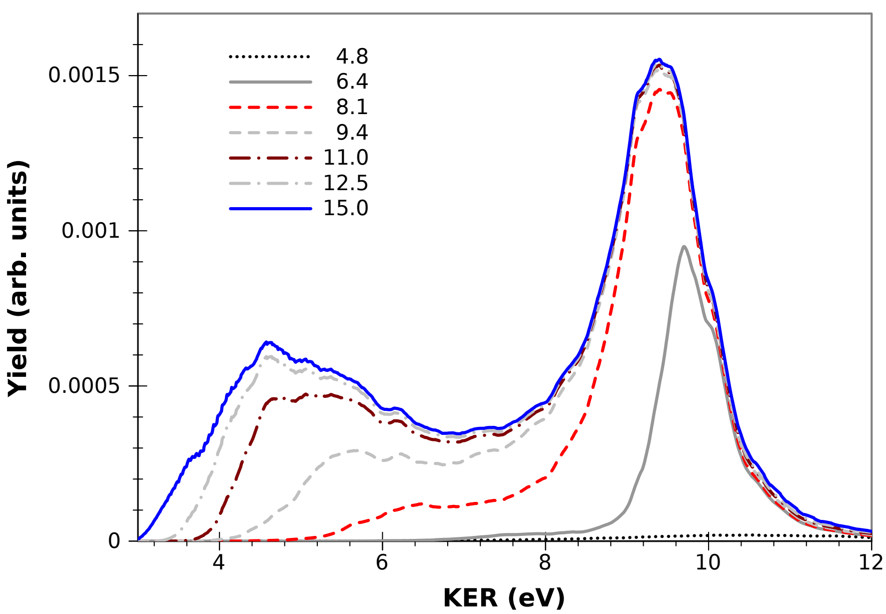

FIG. 3: Time-dependent construction of the KER Spectrum that is related to the peak intensity 4.0×10^{14} W cm^{-2} shown in Fig. 2. The high-energy band of the KER Spectrum appears at first between $\sim$4.8 to $\sim$8 cycles of the laser pulse. After this time, the low-energy band of the KER Spectrum appears.

been used to derive the R-dependent ionization rate of D_2^+ in most previous studies [20–22]. In this figure, we also show the internuclear populations for the different time intervals shown in Fig. 3. This figure shows explicitly that the high-energy band of the KER spectrum in Fig. 3, that is constructed between $\sim 4.8-8$ cycles, has a strong ionization rate about $\sim 4-5$ internuclear distances and the low-energy band of the KER spectrum (Fig. 3), that is constructed between $\sim 8.1-12.5$ cycles, has a relatively strong ionization rate about $\sim 6-7$ internuclear distances. After 12.5 cycles, the intensity of the laser field becomes considerably low (Fig. 1) and a significant population of D_2^+ was becomes ionized as shown in Fig. 5. Therefore it is impossible to appear an enhanced ionization signal for larger internuclear distances.

In Coulomb explosion imaging [23], we want to re-