Resonant Ignition of Doped Helium Droplets

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Resonant absorption of ultrashort pump-probe laser pulses in doped helium droplets is studied for different droplet sizes and dopants.

The process of resonantly ionizing doped helium droplets is studied using ultrashort laser pulses. In a pump-probe process the initially transparent helium droplet turns into a strong absorber of infrared light due to the initial charging of the dopant. The second pulse is then resonantly absorbed at the time the core reaches matching charge density. Seeding the droplet with cluster forming Xenon is compared to evenly distributed Magnesium. Furthermore, the size-dependency of the helium droplet and the amount of dopant atoms are discussed using high charge states as indicator for optimal conditions.

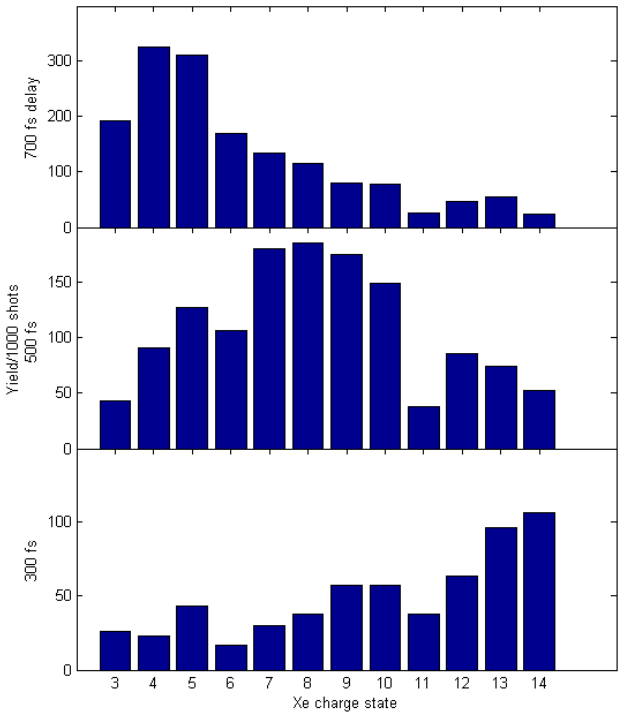

Figure 1. Shift of the yield of different Xenon-charge states for delays of 700 fs (top), 500 fs (middle) and 300 fs (bottom)

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