

## 83Kr isomers induced by femtosecond lasers

### Contenu

Producing nuclear isomers at high rates is very important for many pioneering applications, like nuclear clocks and nuclear (or gamma-ray) lasers, etc. However, limited by the small cross sections and beam intensities, it is hard to achieve high rates of producing nuclear isomers with traditional accelerators or reactors. Here, we report a new experiment of pumping to nuclear isomeric states by a femtosecond high-intensity laser. A peak rate that pumps Kr83 from its ground state to its isomeric state ( $E=41.6\text{keV}$ ,  $T_{1/2}=1.83\text{h}$ ) is observed. It can be explained by the Coulomb excitation of ions with the quivering electrons during the interaction between laser pulses and clusters at nearly solid densities. This high rate isomer-producing method can be widely used for pumping isotopes with excited state lifetimes down to picoseconds.

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