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Atomic Dynamics on the Attoscecond Scale¹

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Advances in ultrashort-pulse technology have made it possible to generate electromagnetic pulses with duration τ_P as short as few hundred attoseconds. τ_P thus approaches the orbital period τ_0 of a classical atomic electron. This advance holds the promise to map out electronic dynamics inside atoms in real time. It poses a considerable challenge to theory to identify observables and novel information that can be accessed and mapped out by attosecond pulses. We will review recent progress with the help of a few examples including time- resolved atomic resonances and double ionization of helium.

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