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Microwave ionization of hydrogen atoms

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Microwave ionization of hydrogen atoms is a process of electron ionization of excited hydrogen atoms by an electromagnetic microwave field when tens or hundreds of photons are required to ionize one electron. Even if a microwave field is relatively weak this multiphoton ionization is much more efficient than a direct one-photon ionization at high photon energies (see Fig.1). Such a rapid ionization happens due to a diffusive growth of electron energy generated by dynamical chaos in the classical system. Quantum effects can suppress this diffusion with emergence of photonic localization which is similar to the **Anderson localization** in disordered solid state systems. The diffusive photoeffect was first observed in experiments of Bayfield and Koch (1974) [1], which happened to be first experiments performed in a regime of **quantum chaos**. The quantum effects of photonic localization were first observed by the group of Koch (1988) [2].

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