

From Millisecond to Attosecond Laser Pulses

Nicolas Bloembergen *

University of Arizona, Tucson, Arizona.

It is remarkable that in a timespan of four decades the duration of laser pulses has been shortened by so many orders of magnitude. Historical highlights of the progression via nanoseconds and picoseconds to femtoseconds will be reviewed. The transition to the attosecond regime during the past decade is based on the extreme optical nonlinearity of optical tunneling. The free electron is driven by the laser pulse and may subsequently recollide with the ion. In this process very high harmonics in the soft x-ray region are generated, permitting observation of phenomena on a timescale shorter than the period of visible light.

* Corresponding author. Tel. 520-626-3479.

Email address: NBloembergen@optics.Arizona.EDU (Nicolas Bloembergen).