

UNPROVABILITY OF INTRA-ATOMIC ELECTRONS

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Particular experts in different sciences have rather inconsistent notions about electrons. For some, it till now flying balls in atoms, for the second a cover in the form of clouds, for the third vectors of conditions etc. Only in one, they are united – that these charged pieces are components of atoms, i.e. particles with the certain sizes. And there is it because they blindly trust physicists-theorists of the last century. But if physicists precisely knew, that itself electron represents they would develop for a long time methods of measurement of its geometrical parameters. So, it is possible to tell, that the model of electron does not exist at all. Even that electron, which experimenters find out in vacuum. Whether it is a ball, whether a top, whether a wave, whether still something dimensionless and slippery, which anything cannot be caught and fixed motionlessly.

Let's try to understand this confused situation.

In directories and encyclopedias about electron is short write so:

Electron represents the subatomic particle reacting to influence both electric, and magnetic fields.

And here is quotation from article about, how in 1897 the young English physicist J. J. Thomson has opened this particle:

«... Thomson has found out, that parity between electric and magnetic fields at which their action is counterbalanced, depends on speed, with which move particles. Having spent a number of measurements, Thomson could define speed of movement of cathodic beams. There were, that they move much more slowly a velocity of light from what followed, that cathodic beams can be only particles as any electromagnetic radiation, including light, extends with a velocity of light. These unknown particles Thomson named "corpuscles", but soon they began to be called «electrons». At once it became clear, what electrons are obliged to exist as parts of atoms — differently, whence they would appear? ... »

Now we understand, that last offer in this quotation from article does not pull even on the indirect demonstration of that electrons are elements of atoms.

But then times were others and in the exact sciences the materialism dominated.

Now the experimental physics has achieved such successes that can operate even with separate photons, and not just with electrons.

Here, for example, the message from news of a science and technique dated November, 2004.

«... Researchers from the German institute of quantum optics of Max Planck (Max Planck Institute of Quantum Optics) have managed for the first time any way to supervise radiation of the unique photon by single ion.

The single ion of calcium suspended in a special trap let out strictly on one photon each time when physicists pressed the button.

...

Thanks to it scientists could with high accuracy and absolutely any way operate quantity of the photons which are let out by an ion, duration and the form of so tiny light impulse.

Also they have created the detector which fixed each photon which has been let out by an ion, individually ... »

From this message logically follows, that at "rating" of atom by resonant energy of various frequency it is possible to force to radiate atom photons with various length of a wave.

About what that ionized atom capable of radiates gamma quantum all of us knew earlier.

Now we will consider some examples.

Example 1. We take the elementary transistor radio transmitter with the small microwave antenna and an independent food from two batteries.

The size – practically nothing, finds room on a palm. Having switched on the transmitter, we can observe, for example, on an oscillograph, radio-waves radiated by it while batteries will not be discharged until then. It about two hours.

To nobody even in a head will not come to declare, that all these radio-waves have been packed in a radio transmitter.

Example 2. The beta disintegration theory asserts that in nuclear of atoms electrons does not present. They take off there from at disintegration of nuclear. I.e. electrons are capable to be born at excitation of nuclear.

The paradoxical situation turns out.

In electronic covers electrons are present and it is possible to knock out them by photon or blow of other particle. And here in nuclear they are not present. It is necessary to excite at first a nuclear, and then still to wait while "childbirth" will take place.

But after all atom this uniform and extraordinary stable formation.

As it is the nature has admitted miss, that in this stable formation there can be "something" and simultaneously it can not to be.

Excuse for sarcasm, but it is difficult to present, to what degree should be zombied a brain of those physicists which allow such alogisms.

Example 3. Series by Layman and by Balmer in a spectrum of hydrogen atom consist of double lines. It is called as splitting of energy levels of that only single electron, which ostensibly exists in atom.

The person who especially is not penetrating into subtleties of wave functions and a parity of uncertainties, will draw the most simple conclusion, that in atom of hydrogen two radiators of photons exist, which are carried on some distance from each other, but in any way one electron, any way changing the characteristics.

Example 4. Experiments on acceleration of the charged particles, for example electrons in linear accelerators, show, that at certain energy of these particles from vacuum the same particles or their antiparticles can be born.

We not begin to assert, that the vacuum is stuffed by them, and accelerate electron knocks out similar электрон electrons or positrons from vacuum. Means, particles all the same are born, as though from anything. But the mechanism of generation of particles from kinetic energy of the flying particle somehow co-operating with vacuum will be more logical.

Example 5. We will try to count, how many electrons are found in one-atomic layer of lithium by means of generator Van-de-Graaf.

Let's spend mentally difficult-realizable, meanwhile, experiment.

Let's make tiny generator by Van-de-Graaf (that it was possible in space with itself to take) with following parameters. Sphere we will make of gold foil in the thickness of 0.5 mm. External diameter of sphere is equal 10cm. An external surface we will cover with a film of lithium in the thickness in one atom. Sphere we will place concentricity in other sphere with internal diameter 13.85cm, made of a gold grid. Between the conveyor of charges and a grid we will include the counter of charges. The capacity of such spherical capacitor will be equal $C=40$ pF (picofarads).

The energies of ionization of first three electrons of gold are equal, accordingly: 9.23eV, 20.50eV, 30.50eV; the work of exit of electron from gold at photoemission is equal 4.8eV.

Amount of atoms in gold sphere of the generator is equally $9.15 \cdot 10^{23}$ pieces.

The energies of ionization of the first, second and third electrons of lithium are equal, accordingly: 5.39eV, 75.64eV, 122.42eV; the work of exit of electron from lithium at photoemission is equal 2.4eV.

Energy of photons that suffices for photo ionization with length wave is hardly shorter 500nm. Amount of atoms of lithium is equal in a monoatomic film of $2.55 \cdot 10^{17}$ pieces.

Here all initial data for experiment.

All it we will place in a space cold and vacuum and we will start to "pump over" electrons from generator sphere on a grid.

According to the existing theory if in metal (both in lithium and in gold) there are free electrons the generator will pump over all these electrons on a grid, and between sphere and a grid some limiting electric voltage will be mounted. The generator will work idle hereinafter. If now to switch on a light source with length wave 500 nanometers on idea should occur nothing. Energy of photons is small to ionize atoms of lithium, and free electrons on a sphere surface do not remain. If further to increase energy of photons, shining sphere as more short-wave radiation at energy of photons 5.39eV the ionisation of atoms of lithium should begin, and the counter again will start to count electrons. If one-shot to ionise all atoms of lithium that a negative charge on generator sphere becomes equal 0.041 Coulomb, and voltage between sphere and a grid will increase on 1.021 Gigavolt!!!

Long before such voltage from a sphere surface the metal will start to evaporate.

The demanded result of experiment means is essentially unattainable.

Absolutely concrete conclusion follows from these while five examples, that any experiments it is impossible to prove, that the atom contains the final number of electrons equal to its serial number in the table of Mendeleyev.

Now, there is our explanation or, if you want, a hypothesis.

In our polytronic physics atoms are modeled as the designs collected from energy rings which we name polytrons. The polytron is a multifrequency receiver, the store and the radiator of electromagnetic energy. We have applied model of a radial polytron to calculation of energy spectra of atoms, and have found the formula for calculation of series of own resonant frequencies atomic oscillators.

$$\nu(m) = \frac{c \cdot m^2}{4 \cdot \pi \cdot D} \cdot k_d \quad (1)$$

Where c – speed of light
 m – frequency quantum number
 D – diameter of oscillator
 k_d – factor of elasticity of a energy ring

For hydrogen and helium $k_d = 4$

Listed below drawing explains work of radial polytrons in a mode of radiation of photons.

So, for example, at transition of one of radial polytrons of excited atom from a frequency order $m=2$ to a frequency order $m=4$ the atom throws out a photon with energy 10.199eV. At transition of a polytron from a frequency order $m=2$ to a frequency order $m = \infty$ the atom radiates gamma quantum with energy nearby 13.598eV.

If a radial polytron to "pump up" energy so, that its frequency order will try to take value $m=1$ the atom will throw out not a photon, but the girdled wave which represents the electrically charged corpuscle.

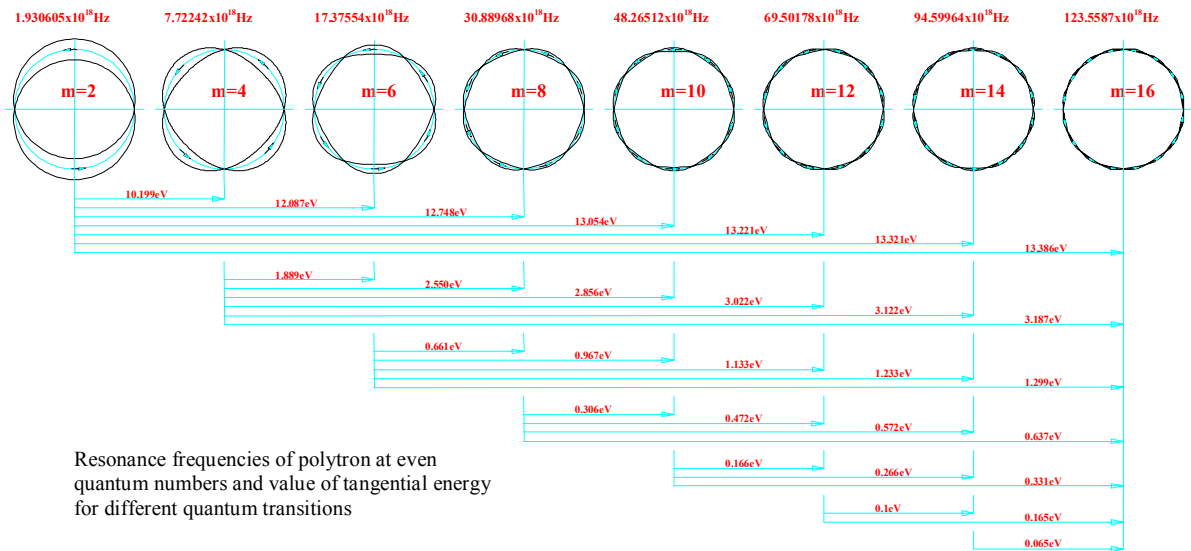


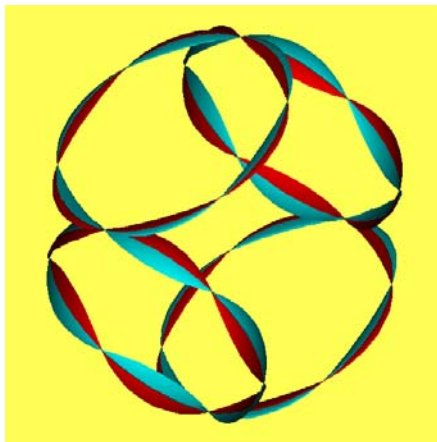
Fig. 1 Quantum transitions in multifrequency ring oscillator in atom of hydrogen

Now, pay attention to two limiting cases.

At $m=1$, we will see "a static ring".

At $m = \infty$, we will see also "a static ring".

And in the end of our story we result polytronic model of atom of hydrogen which all polytrons "are pumped up" by energy to a frequency order $m=6$.



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Ученые сделали первую фотографию электрона

Первый фотоснимок электрона в его «энергетической ипостаси» сделали европейские ученые. Фотография опубликована в лондонском еженедельнике Observer.

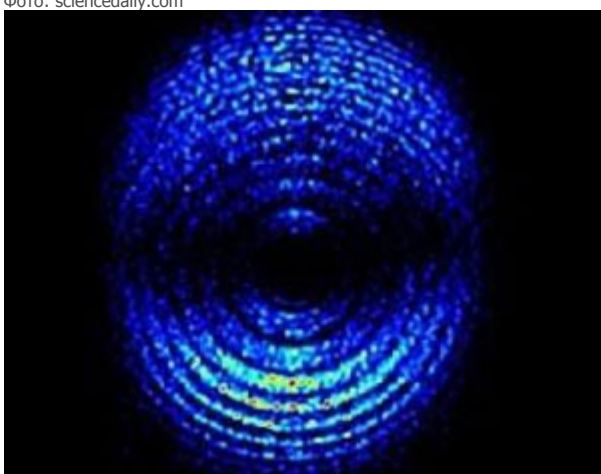
Заснять элементарную частицу удалось научной группе из шведского университета города Лунд.

«Портрет» электрона представляет собой десять концентрических кругов, которые являются его энергетическим выражением.

В работах был использован сложный фотокомплекс, включающий лазер, спектрометр и стробоскоп. Съемки на высоких скоростях через кратчайшие промежутки времени проводились в момент яркой вспышки света, которая вызывала распад атомов и выделение электронов. Последние попадали на специальную мишень.

Полученные в момент удара о мишень многочисленные снимки элементарных частиц затем были наложены друг на друга. В результате ученые получили первое четкое фотографическое изображение электрона, отмечает еженедельник, отмечает ИТАР-ТАСС.

4 марта 2008, 17:51
Фото: sciencedaily.com



Looking at this photo we had at once following questions:

– Through what time intervals these picture were produced?

We, by means of the polytronic equations, can calculate resonant frequencies beaten out from emitter electrons, and then to define phases of oscillations.

– What substances were used in the emitter of electrons and in the target?

These data will allow executing mathematical calculation of process.

– In what frequency range of light the irradiation of the emitter was made by flash?

If this range is wide enough, these rings can testify to various kinetic energy of beaten out electrons. The more energy of electron, the more is diameter of a ring.

– By imposing of pictures it is possible to receive a picture of phase conditions of electron.

Why researchers have decided, what so all electron looks?

Preliminary conclusion: If the electron is a girdled photon (or a girdled wave) with quantum number $m=2$ then the picture really confirms the toroidal form of electron.

THE ANALYSIS OF EXPERIMENT OF THE SWEDISH PHYSICISTS

The analysis is executed on the basis of article published in magazine

PHYSICAL REVIEW LETTERS (PRL 100, 073003 (2008)) under heading:

Coherent Electron Scattering Captured by an Attosecond Quantum Stroboscope

Authors of research:

J. Mauritsson,^{1,2} P. Johnsson,^{1,3} E. Mansten,¹ M. Swoboda,¹ T. Ruchon,¹ A. L'Huillier,¹ and K. J. Schafer²

(Received 15 November 2007; published 21 February 2008)

And information in pictures from university in the city of Lund under the name:

Anne L'Huillier, Lund Univ. (KITP Attosecond Conf 8-03-06) Atomic Physics with Attosecond Pulse Trains

The summary to article:

We demonstrate a quantum stroboscope based on a sequence of identical attosecond pulses that are used to release electrons into a strong infrared (IR) laser field exactly once per laser cycle. The resulting electron momentum distributions are recorded as a function of time delay between the IR laser and the attosecond pulse train using a velocity map imaging spectrometer. Because our train of attosecond pulses creates a train of identical electron wave packets, a single ionization event can be studied stroboscopically. This technique has enabled us to image the coherent electron scattering that takes place when the IR field is sufficiently strong to reverse the initial direction of the electron motion causing it to rescatter from its parent ion.

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It is the present torture for a brain – to translate from English article written by Swedes.

Even according to ITAR-TASS it is visible, that the correspondent has very badly understood an experiment essence on which has informed London weekly journal *Observer*.

For example, the citation «... *Shootings on high speeds through the shortest time intervals were spent to the moment of bright flash of light which caused disintegration of atoms and allocation of electrons ...*» misleads the reader. As disintegration of atoms is called nuclear reaction, but in any way process of ionization of atoms which occurs at an irradiation of atoms the laser.

But, anyway, we will try to understand this difficult and thin experiment because also experimenters rather tangled explain the received results.

The block diagrams of the equipment for experiment and the experiment are resulted on listed below pictures (fig. 2, fig. 3 and fig. 4).

In experiment the infra-red laser with length wave 800nm (nanometers) and duration of impulses 35fs (femtoseconds) was used. Frequency of light in a laser impulse is equal 3.747×10^{14} Hz (hertz), accordingly, the period of oscillations in an impulse is equal 2.669fs.

For extent of one laser impulse 13 electromagnetic waves of infra-red light with length wave 800nm keep within. It is accepted to name such continuous pieces of light as μ ug of photons. But it does not mean, that each impulse of the laser consists from μ ugs of 13 photons in everyone. At a laser impulse can be present and shorter μ ugs.

Energy of one photon in a laser impulse is equal to product of the Planck's constant by frequency of radiation. In experiment of the Swedish physicists worked photons with energy 248×10^{-18} mJ (milli-joules) or 1.548eV ($1\text{mJ} = 6.24150974 \times 10^{15}$ eV).

Energy of the impulse in experiment was equaled 2mJ. Hence, each impulse consisted of 8×10^{15} photons, or about 620×10^{12} full-weight μ ugs. Apparently, authors of article in magazine *PHYSICAL REVIEW LETTERS* just also name these “packs of μ ugs” as wave packages. But, besides, they still use expression “an electronic wave package” (EWPs).

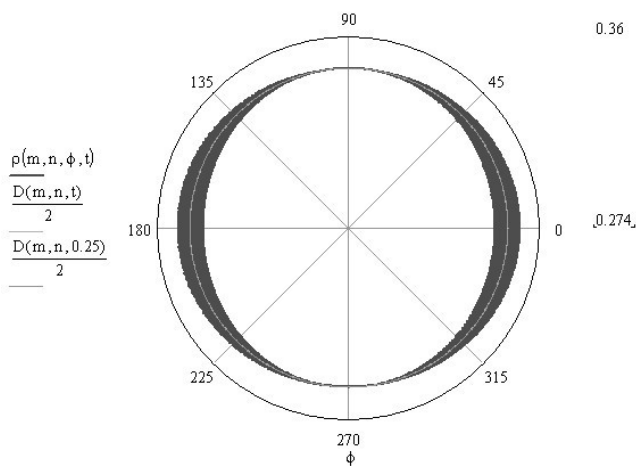
This set phrase demands an additional explanation.

On fig. 4 it is shown, that laser radiation is focused into a point before a reflector (repeller) where the cloudlet from the ionized atoms is represented. Let's count up, how many atoms can simultaneously be in this cloudlet.

The characteristic size of a potential hole of electric field of a laser wave is equal 400nm, on points of zero-crossing with co-ordinate. At pressure of gas (argon or helium) in the vacuum chamber, equal 20÷30mbar, in gas cubic meter 10^{22} atoms contain approximately. Then in a spherical cloudlet there should be 300÷400 atoms. In the first experiment for ionization of atoms of argon by ultraviolet impulses (XUV) with duration of impulses 300as and energy 24eV in the presence of the synchronizing infra-red laser field intensity 5×10^{12} W/cm² were used. Energy of ionization of atom of argon is equal 15.758eV. Authors do not specify length of a wave of an ultraviolet and a harmonic allocated by beamsplitter of a beam from the basic radiation of the laser in article. But, even from the resulted data, it is clear, that any quantity of atoms of argon in a cloudlet will be ionized obligatory. Further the released electrons are extended by an ex-tractor from a cloudlet, accelerated by electric field between an ex-tractor and "earth", and fly to the luminescent phosphoric screen. It is, the acquaintance for everything, a kinescope principle, with that difference, that function of the emitter of an electronic gun carries out a clot of atoms of argon and all processes in this "an electronic gun" are synchronized in time, i.e. are coherent. For an explanation, received on the phosphoric screen, pictures arise two more variants, besides, which authors of research have offered.

I variant. Electric field of infra-red radiation of the laser shakes electrons in a cloudlet upwards-downwards and, therefore, they take off from a cloudlet under different angles. But here is one discrepancy with result of experiment. In points of image on the screen on the horizontal axis of symmetry (fig. 4 see) there should be bright stains, but not ruptures between arches.

II variant. The electron represents the girdled photon (see on fig.1 extreme left condition) which energy ring makes radial fluctuations with frequency 1.93×10^{18} Hz that corresponds to a quantum condition $m=2$. Electrons always fly rectilinearly if the ring axis is parallel to a flight direction. Therefore, electrons, after flight through the aperture, fall on the phosphoric screen "flatwise". Radial fluctuations of a ring initiate a luminescence in phosphorus and thus form own portrait. But in this variant also there is an unresolved question. Theoretically calculated diameter of a ring is equal only 0.2nm, i.e. any optics it to see it is impossible. In below shown drawing the portrait of this ring electron, also in energy embodiment is presented.



Characterization of attosecond pulses

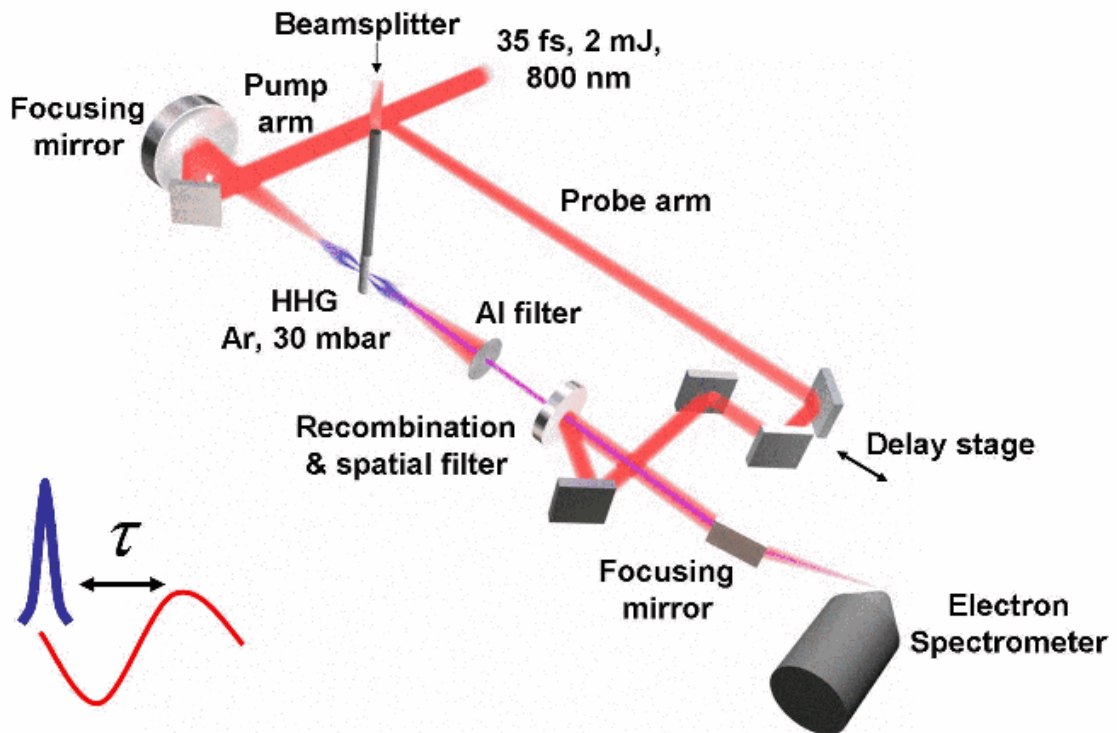


Fig. 2 Block diagram of the experimental equipment named by authors as attosecond quantum stroboscope

Amplitude and phase control

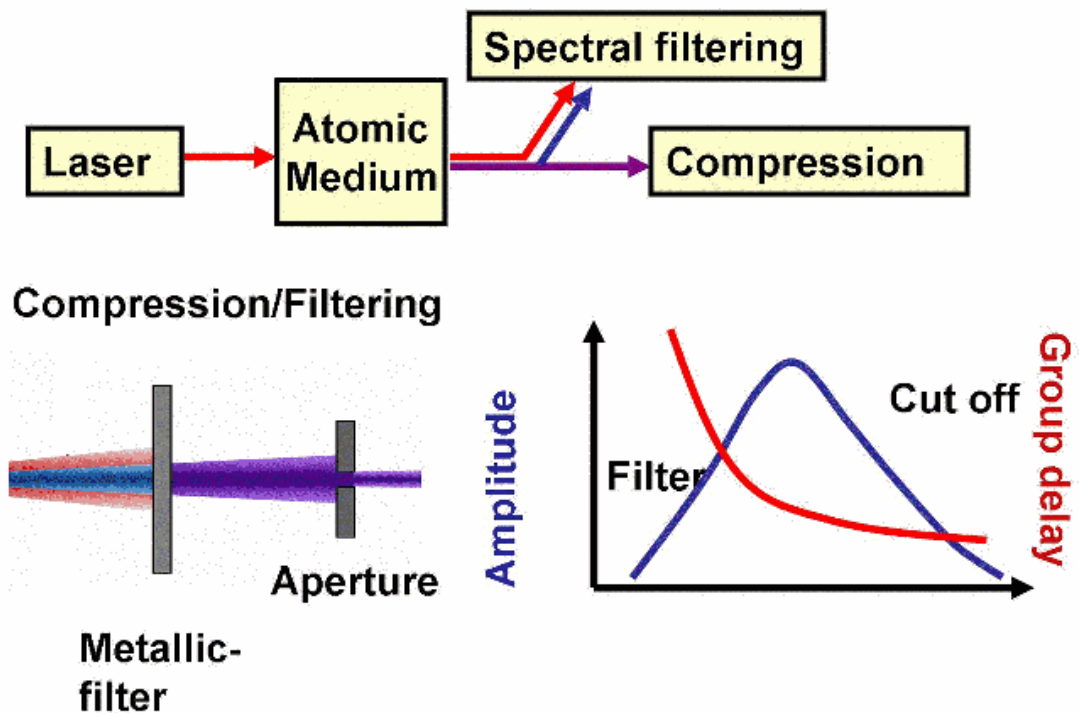


Fig. 3 Block diagram of experiment with detailing of process of formation of electronic beam

Experimental set up

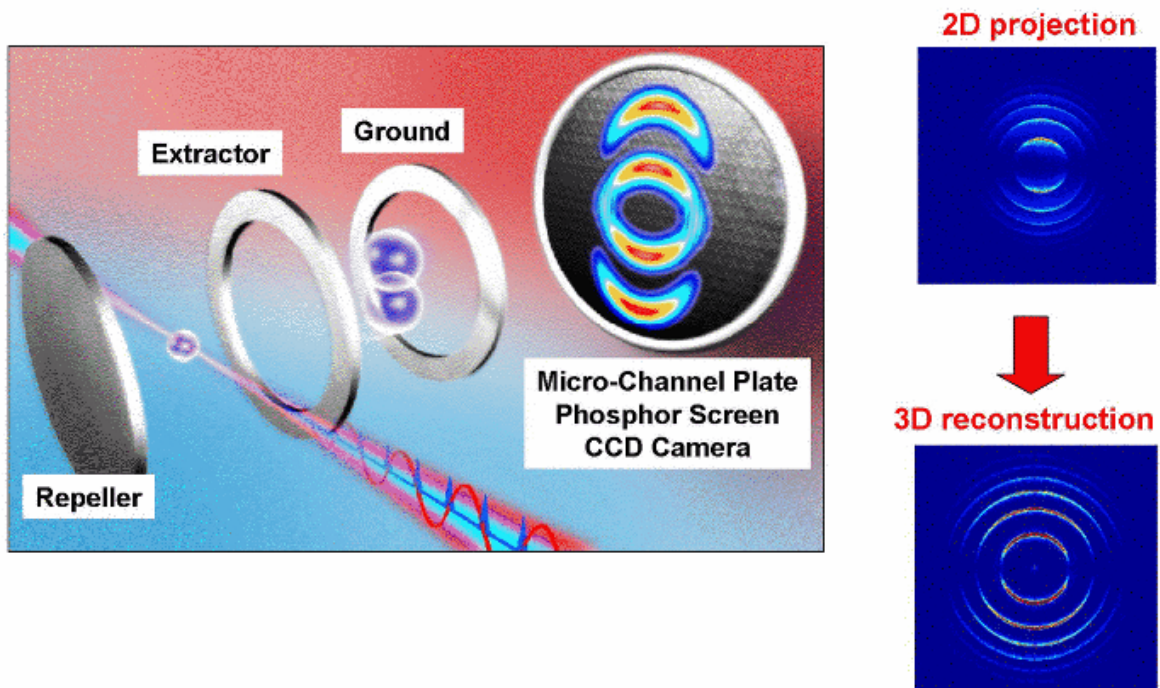


Fig. 4 Block diagram of experiment with the conditional image of received results

Listed below photos are taken from article of authors.

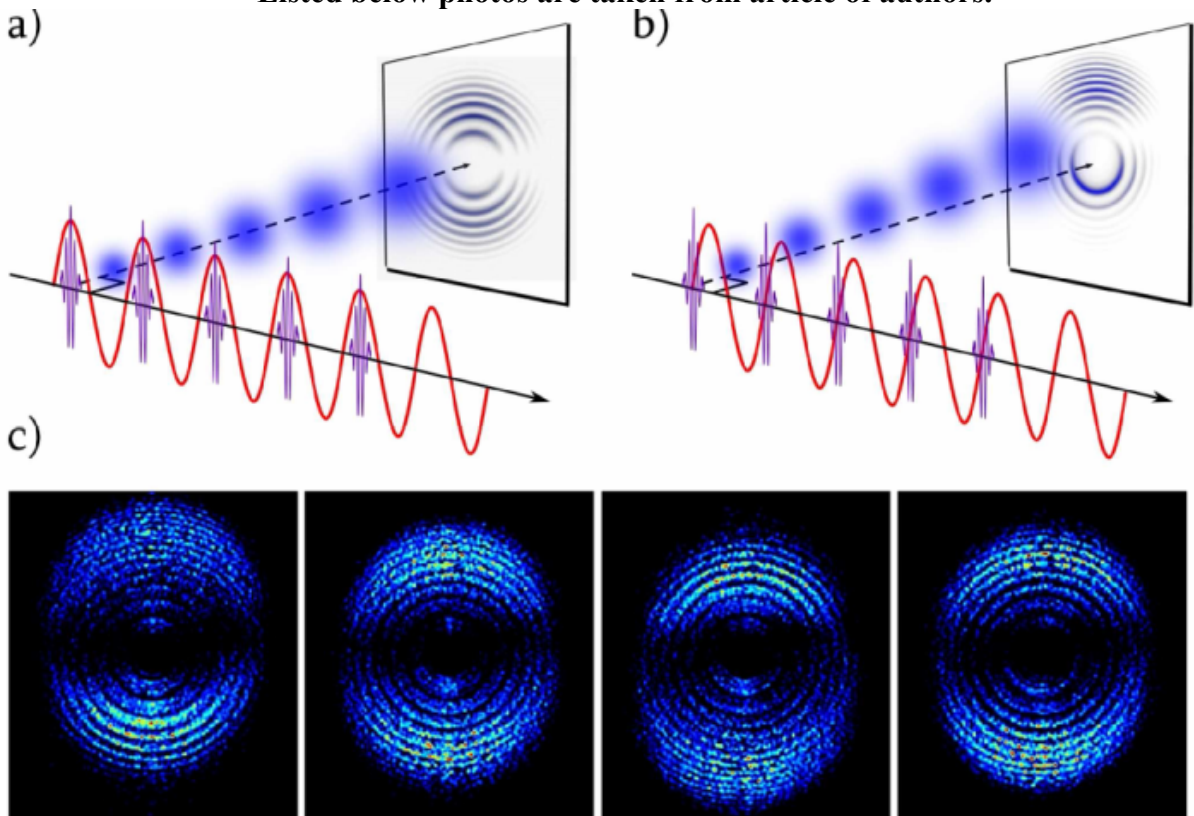


FIG. 1-PRL 100 (color online). (a), (b) An attosecond pulse train (APT) is used to ionize the target atoms once per cycle of an infrared (IR) laser field. When the electron wave packets (EWPs) are created at the maxima of the IR electric field (a), the net transfer of momentum is zero, and the resulting momentum distribution is symmetric relative to the plane perpendicular to the laser polarization. When the EWPs instead are created at the zero-crossings of the IR electric field (b), the momentum distribution is shifted by the field along the direction of the laser polarization. (c) Experimental results obtained in Ar at four different XUV-IR delays are shown. From left to right, the images correspond to the XUV-IR delays $t_0 = 0, \pi/2\omega, \pi/\omega, 3\pi/2\omega$ for an IR intensity of $5 \times 10^{12} \text{ W/cm}^2$.

