elliptical tracks

evidence for superluminal electrons?

• quantized elliptical tracks

• sizes expected of bound monopoles

• yet requiring $v > c$
ICCF 11: Urutskoev, Ivoilov, Lochak, Strange radiation

ICCF 18: replication of tracks with simplified technique

Do these particles respond to electric or magnetic fields?
track cce

a = 621.1 ±7.3 μm

n = 5.0

a.) Ellipse fitted to track
b.) After processing and background eradication.
c.) Photo using Leitz PL 40x objective.
track lee2

\[ a = 56.9 \pm 13.0 \, \mu m \]

\[ n = 2.75 \]

a.) Ellipse fitted to track
b.) After processing and background eradication.
c.) Photo using Leitz PL 100x objective.
a = 4078.6 ±14.6 μm

n = 8
track rse2

\[ a = 56.7 \pm 9.5 \, \mu m \]

\[ n = 2.75 \]
breakthrough

- No observed curvature effects due to applied electric or magnetic fields

- Decay events

- the ellipses must be bound states caused by an inverse square (1/r^2) central force

- Elliptical tracks are $137^2 n^2$ bigger than Bohr-Sommerfeld hydrogen
\[ 137^2 n^2 = \frac{n^2}{\alpha^2}, \quad g = 2g_D \]

larger than Bohr-Sommerfeld hydrogen
g = \frac{ec}{\alpha}

Schwinger quantization condition \quad g = 2g_D
using analogy with the electron, the coupling constant for the magnetic monopole is

$$\alpha_m = \alpha^{-1} = k_m \frac{g^2}{\hbar c}$$
Semi-major axes of the fitted ellipses, $a_m$, differ from the semi-major axes, $a_e$, of corresponding Bohr-Sommerfeld ellipses for hydrogen by $\sim 137^2 n^2$.

Using $g = 2g_D$, 

$$a_m = a_e \frac{n^2}{\alpha^2}$$
For $n = 1$,

\[
\frac{a_{0m}}{a_{0e}} = \frac{1}{\alpha^2}
\]

Substituting the Bohr radius, $a_{0e} = \frac{\hbar}{m_e c \alpha}$, and the monopole Bohr radius, $a_{0m} = \frac{\hbar \alpha}{m_m c}$ ($\alpha_m = 1/\alpha$),
monopole mass:

\[ m_m = m_e \alpha^4 \]

\[ = 1.45 \times 10^{-3} \text{eV} / c^2 \]
interesting aside...

$$1.45 \times 10^{-3} \text{ eV} / c^2$$

$$\sim 1.33 \times 10^{-3} \text{ eV} / c^2$$

$$= 2 \times (1.3 \times 10^{-9} m_e)$$

John Wallace’s exceedingly small effective mass
Bohr radius

\[ a_{0e} = \frac{\hbar}{m_e c \alpha} \]

\[ a_{0m} = \frac{\hbar \alpha}{m_m c} \]

gso velocity

\[ v_{0e} = k_e \frac{e^2}{\hbar} = c \alpha < c \]

\[ v_{0m} = k_m \frac{g^2}{\hbar} = \frac{c}{\alpha} > c \]
there is a relativistic scale transformation between $v > c$ and $v < c$ frames

$$\left( \frac{n^2}{\alpha^2} \right)^2 \left( \frac{x^2}{a_m^{(n)2}} + \frac{y^2}{b_m^{(n)2}} \right) = 1,$$

here contracting the monopole ellipse into the electron ellipse
the Coulomb flip

\[ (n = 8) \]

\[ v < c \text{ frame} \]

\[ v > c \text{ frame} \]

\[ (n = 8) \]

\[ a = 4066.8 \mu m \]

\[ a = 0.0034 \mu m \]

\[ \text{monopole} \]

\[ \text{charge} = g \]

\[ \text{charge} = e \]

\[ \text{electron} \]
the superluminal electron, equivalent to a magnetic charge, together with the subluminal electron, creates the condition for charge quantization
next

- replicate quantized elliptical tracks
- thick nuclear track emulsions
• repeatable experiment
• consistent with the idea of magnetic charge
• best evidence yet for magnetic charge?
• funding for 1 physicist
keith@restframe.com
Q: How can you be sure that the applied magnetic fields are not responsible for the tracks?

A: The magnetic source creating the central force for the ellipse has to be a spherically symmetric point source. The applied magnetic fields were not spherically symmetric point sources.

Q: Under quantum mechanics, how can these tracks even occur? Any sharply defined track, including all those routinely observed in bubble chambers or in photographic films, is produced by a sufficiently small, fast moving wave packet. And the latter is generally formed only by a superposition of many stationary states, even though each such state alone is spatially extended. This is universally true in relativistic and non-relativistic domain. One cannot in principle attribute a single definite quantum number \( n \) to a semi-classical track observed.

A: This apparent contradiction points to new physics. The classical tracks occur and are quantized making them semi-classical in the spirit of Bohr-Sommerfeld.
1.) initial particle, $P_1$, trajectory.

2.) at point a. particle decays into $P_1'$, continuing on initial trajectory and $P_2$, which is captured into an elliptical orbit.

3.) at point b. particle escapes from the elliptical orbit.
Fredericks
   uniform photon exposure
  /\       |
Urutskoew
     discharges in water
         /\       |
Ivoilov
       discharges in water
              /\       |
Priem, Daviau, etc
       discharges in water
              /\       |
Others
     glow discharge, laser irradiation, electron beams
     \       |
Lochak
    light leptonic monopole
Periodicity

Penetration

Random motion

Correlation of tracks

Central force

Tracks in various materials — emulsions, metals, semiconductors

Large angles of curvature

White tracks
<table>
<thead>
<tr>
<th>track</th>
<th>$a(\mu m)$</th>
<th>$b(\mu m)$</th>
<th>$n$</th>
</tr>
</thead>
<tbody>
<tr>
<td>e2</td>
<td>4091.7 ± 22.5</td>
<td>2241.3 ± 22.5</td>
<td>8.00</td>
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<tr>
<td>be</td>
<td>4078.6 ± 14.6</td>
<td>1996.0 ± 14.6</td>
<td>8.00</td>
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<tr>
<td>ode</td>
<td>4077.0 ± 16.1</td>
<td>1129.4 ± 16.1</td>
<td>8.00</td>
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<tr>
<td>abt</td>
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<td>1053.6 ± 10.3</td>
<td>8.00</td>
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<tr>
<td>tlw</td>
<td>3141.0 ± 30.5</td>
<td>1474.4 ± 30.5</td>
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<tr>
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<td>549.3 ± 16.1</td>
<td>7.00</td>
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<td>1100.5 ± 24.9</td>
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<td>ego</td>
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<td>300.7 ± 21.1</td>
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<td>omse</td>
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<tr>
<td>avse2</td>
<td>25.6 ± 6.4</td>
<td>15.9 ± 6.4</td>
<td>2.25</td>
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</tbody>
</table>
superluminal dual of electron

\[
E_m^{(n)} = -k_m \frac{g^2}{2a_m^{(n)}}
\]

\[
\nu_m^{(n)} = n \frac{c}{\alpha}
\]

\[
p_m^{(n)} = \frac{n\hbar}{a_m^{(n)}}
\]

\[
m_m^{(n)} = \frac{n^4\hbar\alpha}{a_m^{(n)}c}
\]

electron

\[
E_e^{(n)} = -k_e \frac{e^2}{2a_e^{(n)}}
\]

\[
\nu_e^{(n)} = c \frac{\alpha}{n}
\]

\[
p_e^{(n)} = \frac{n\hbar}{a_e^{(n)}}
\]

\[
m_e^{(n)} = \frac{n^2\hbar}{a_e^{(n)}c\alpha}
\]
Observation of transformation of chemical elements during electric discharge Urutskoev, L. I.; Liksonov, V. I.; Tsinoev, V. G. (2000)


Unusual structures on the material surfaces irradiated by low energy ions, B. Rodionov and I. Savvatimova, (2005)


Transmutations et traces de monopôles obtenues lors de décharges électriques, D. Priem et al. (2009).

