Internal Ionization and Secondary Mass

Prof. K.V.K. Nehru, Ph.D.

In the *Reciprocal System*, the motion that is identified as the electric charge is a one-dimensional rotational vibration (RV^1) which modifies a basic rotation (R), which is also normally one-dimensional. Similarly, the motion that is identified as the magnetic charge is a two-dimensional rotational vibration (RV^2), modifying the basic two-dimensional rotation (R^2).

In order to clearly bring out the principles on which the manifestation of the mass effect of the charges, called the secondary mass, is based, a comparison of the cases of the electron, the positron and the proton is drawn up in Table I below. We will use the following notation adopted by Larson:

p – primary mass
m – magnetic mass
E – electric mass (3 dim.)
e – electric mass (2 dim.) = (2/3)E
C – mass due to normal electric charge (3 dim.)
c – (2/3)C (2 dim.)

and further introduce,

S – space displacement
T – time displacement

Table I: Comparison of the Electrically Charged Subatomic particles

Particle	Notation	Space-time direction of the charge	Mass composition
Charged electron	M- 0-0-(1)	T	e-c
Charged positron	M+ 0-0-1	S	e-c
Charged proton	M+ 1-1-(1)	S	p+m+2e+C

The conclusions that could be drawn from an examination of Table I, regarding the sign of the secondary mass increment are summarized in Table II. The negative electric charge is a one-dimensional RV with a time displacement and the positive electric charge is a one-dimensional RV with a space displacement. From Table I it is clear that the mass increment due to the charge is positive if the displacements of both the one-dimensional RV and the one-dimensional R are of the same space-time direction (cases (3) and (4), Table II). On the other hand, the secondary mass increment is negative if the displacements of the one-dimensional RV and the one-dimensional R are respectively of opposite space-time directions (cases (1) and (2)).

Table II: The One-dimensional Rotational Vibration

Case	**Rotational Base**[1]	**Nature of charge**	**Space-time direction RV**[1]	**R**[1]	**Algebraic sign of the secondary mass increment**
(1)	M	negative	T	S	-
(2)	M	positive	S	T	-
(3)	M	positive	S	S	+
(4)	M	negative	T	T	+
(5)	C	positive	S	T	-(-) = +

Case (5) deals with the direction of the mass contribution by an electric charge acquired by a rotation on the cosmic rotational base rather than on the normal, material rotational base. In this case too, the sign of the mass increment follows the same rule as above, but since the basic motion is on the opposite side of a regional boundary, the direction of the effect is reversed. Thus the mass increment (in the material sector) due to a positive charge acquired by a one-dimensional rotational time displacement on a cosmic rotational base is positive.

1 Internal Ionization

Because of the ever-present environmental thermal vibrations, the subatomic as well as the intermediate particles get always electrically charged. They may remain in the uncharged condition only at low temperatures or when the effective displacement in the magnetic dimensions is of the "½-½" type. This is the reason why the electrons and the protons are always found in the charged state, and the neutrinos and the massless neutrons in the electrically uncharged state.

In the case of the intermediate particles, the two rotating systems take on a unit of electric charge each. But these two charges happen to be of opposite space-time directions because the charge on one of the rotating systems forces an equal and opposite charge on the second system in order to have an internal equilibrium. This phenomenon can be seen to be akin to the acquirement of a gravitational charge by an atom in order to equilibrate the magnetic charge of the neutrino captured by it, except for the difference in the number of dimensions of the charge motion. We will call this process "internal ionization" because it pertains only to the mutual equilibrium of the two rotating systems of a single particle (or atom). Normally it is to be expected that a positive and a negative charge neutralize each other. But the continual thermal pumping from the environment sustains the internal ionization.

2 The Intermediate Particles

We will now consider the secondary mass situation in the case of the two intermediate particles, namely, the mass-one hydrogen and the compound neutron. Though the net charge due to the internal ionization is always zero, we will find that the mass effect of these two charges does show up, in the case of the intermediate particles.

The H^1 system is usually denoted as $\left.\begin{matrix} M\ 1-1-(1) \\ M\ ½-½-(1) \end{matrix}\right]$ with the mass composition of p+m+2E, giving a mass of 1.00812815.[2] As explained above, a condition of greater probability in the local environment

1 M = material base and C = cosmic base
2 Larson, Dewey B., *Nothing But Motion*, North Pacific Publishers, Portland, OR, USA, 1979, p. 167.

would be that when both the rotating systems acquire an electric charge. The charge on the proton-type rotation can be either positive or negative as both a rotation with time displacement and a rotation with space displacement are available to act as a base for it. But the M-neutrino-type rotation can take on only a negative charge—like the M-electron—since this is solely determined by the space-tine direction of the rotational displacement in the electric dimension (the "½-½" effective displacement in the case of the neutrino, and the "0-0" effective displacement in the case of the electron, in the magnetic dimensions, being of no help to act as a base for the one-dimensional RV). Thus the more probable, internally ionized state of H^1 can be designated as $\left.\begin{matrix} M^{+}\,1-1-(1) \\ M^{-}\,½\text{-}½-(1) \end{matrix}\right]$.

The magnitude of the secondary mass contributed by the positive charge on the proton-type rotation is C because it is distributed over three effective dimensions, while that by the neutrino-type rotation is only c, in view of the dimensional character of this rotation (namely, the "½-½" effective rotation). Further, it can be seen that the mass increment due to the charge on the proton-type rotation is positive as it belongs to the case (3) (Table II), whereas that due to the charge on the neutrino-type rotation is negative as it belongs to the case (1). Therefore, the mass composition of the internally ionized H^1 should be p+m+3e+C-c. Adopting the values listed by Larson,[3] this gives a mass value of 1.00814313, which compares mere favorably with the observed value of 1.008142, than the value 1.00812815 given by Larson.[2]

The second particle in the intermediate class is the compound neutron $\left.\begin{matrix} M\,1-1-(1) \\ C\,(½)-(½)-1 \end{matrix}\right]$ with the mass composition of p+m+3e+E, giving a mass value of 1.00899621. In this case, the charge that the c-neutrino-type rotation can take on is positive since the displacement in the electric dimension—which decides the charge type, rather than the "½-½" displacement in the magnetic dimension—is a space displacement. Thus the internally ionized compound neutron is to be designated $\left.\begin{matrix} M^{-}\,1-1-(1) \\ C^{+}\,(½)-(½)-1 \end{matrix}\right]$.

Once again the mass contribution from the charge on the proton-type rotation is C, while that from the neutrino-type rotation is c, the former being negative (belonging to case (1), Table II) and the latter positive (case (5)). Thus the mass composition becomes p+m+3e+E-C+c. The calculated mass is 1.00898123. This is nearer to the observed value of 1.008982 than the value 1.00899621 given by Larson.[2]

3 The Atoms

The ease with which electric charges are acquired by the rotational systems in the local environment, producing the internal ionization, also clarifies an important aspect concerning the (external) ionization of the atoms. The total number of positive charge units that an atom possibly can acquire equals Z, where Z is the atomic number. In the *Reciprocal System* the atomic number is the net total equivalent electric displacement. And the unit of electric displacement in the atomic structures is defined as the equivalent of two natural one-dimensional displacement units.[4] Consequently, the net displacement of an atom of atomic number Z, in terms of the *natural units* is 2Z.

An examination of the motional structure of the subatomic particles shows that (i) the unit of electric

3 *Ibid.*, p. 164.
4 *Ibid.*, p. 128.

charge that these particles can acquire is the *minimum* that is possible and is, therefore, the unit of one-dimensional RV in general, and (ii) inasmuch as a charge is a modification of the basic rotation, the number of unit charges a rotation can take on is only one per natural unit (of rotational displacement). As such, the total number of electric charges an atom can acquire comes out to be 2Z according to the *Reciprocal System*, in glaring contradiction to the known fact.

The reason why the fully ionized atom cannot acquire more than Z number of charges, however, is as follows. We have seen that, in the local environment, a rotating system easily acquires an RV (i.e., an electric charge), and that in a rotational structure, if there are two rotating systems, the charges on each of them are mutually of opposite space-time directions in order that they are in internal equilibrium. As such, each of the two rotating systems of an atom acquires Z number of electric charges: one system carrying Z positive charges and the other Z negative charges. This leaves the atom, itself, electrically neutral.

There is no net contribution to the secondary mass either, since the mass effects of these two sets of charges mutually cancel out (belonging to cases (2) and (4), Table II, respectively). It may be noted that in the case of the intermediate particles, even though the *charge* effects of the positive and the negative electric charges acquired respectively by the two rotating systems likewise cancel out, the *mass* effects of these charges do not cancel out as their numerical magnitudes are different, being C and c.

Now it can be seen that the ionization of a neutral atom consists in supplying additional one-dimensional RV space displacements which successively cancel out the Z negative charges existing in one of its rotating systems. The net secondary mass increment due to the (external) ionization of the atom can be computed from a knowledge of the degree of ionization and the algebraic sign of the increment (Table II).

4 Secondary Mass Effects of Two-dimensional Charges

Table III below shows the effects of the space-time direction of two-dimensional charges on the algebraic sign of the secondary mass contributed by them.

Table III: The Two-dimensional Rotational Vibration

Rotational base	Nature of charge	Space-time direction RV^2	R^2	Algebraic sign of the secondary mass component
M	magnetic	S	T	-
M	gravitational	T	T	+

It can he seen that the general rule is the same as in the case of the one-dimensional RV: the mass increment due to the gravitational charge is positive since the gravitational charge—which is a two-dimensional RV—and the basic two-dimensional rotation are both time displacements. On the other hand, the mass effect of a magnetic charge—which is a two-dimensional RV with space displacement—should be negative.[5]

The motion that constitutes the magnetic charge is on the far side of another regional boundary and is subject to two successive interregional transmission factors. In the case of the electric charges (which is a one-dimensional RV), the mass of unit charge is the reciprocal of the product of two interregional

5 *Ibid.*, p. 191.

ratios.[6] Since the magnetic charge is a two-dimensional RV, the interregional ratio pertaining to the charge region becomes $(156.44)^2$ (see Figure 1(b)). Thus the secondary mass arising out of the magnetic charge amounts to

$$-\frac{1}{156.44^2}\times\frac{1}{156.44}=-2.6177\times10^{-7}=-243.19\,\mathrm{eV}$$

The situation, however, in the case of the two-dimensional RV with time displacement, the gravitational charge, is altogether different. The third region, in which the motion of this charge takes place, turns out to be toward "our side" of the time region, rather than the far-side, and therefore coincides with the region outside unit space (represented by line "O" in Figure 1(c)). Thus the net interregional ratio applicable to the gravitational charge is 1. Consequently the secondary mass contribution of the gravitational charge is one full unit: 931.152 MeV.

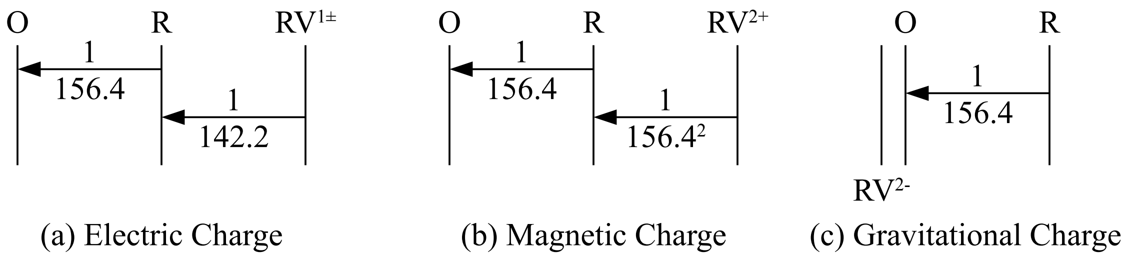

Figure 1: Interregional Ratios Pertaining to the Different Regions

6 *Ibid.*, p 163.