- This is the *negation* judgment of the ***quality*** angular momenta fermion locality $\Psi_? \notin \mathfrak{Z}$.

The six orthogonal ***outwards*** are just the cubic symmetry of the Cartesian system, in § 6.6.1.3.
Higher than four separations of ***outwards*** orientated ***directions*** will not help us further. They can always be linearly combined into three independent that project to the fourth external ***direction***.
The thought of multiple excitations of ***entities*** $\Psi_{½}$ in one and the same location intersection of $\pm\frac{1}{2}\boldsymbol{i}_1, \pm\frac{1}{2}\boldsymbol{i}_2, \pm\frac{1}{2}\boldsymbol{i}_3$ is not allowed. Alternatively, it will just be the same, this we express as

$$\left(\pm\tfrac{1}{2}\boldsymbol{i}_k\right) \underset{\text{locality}}{\overset{\text{same}}{\oplus}} \left(\pm\tfrac{1}{2}\boldsymbol{i}_k\right) \longrightarrow \left(\pm\tfrac{1}{2}\boldsymbol{i}_k\right), \quad \text{internal for the one local exclusive } \Psi_{½} \textit{ unit}. \tag{6.514}$$

- This is the *limitation* of the exclusive indivisible unity of one locality ***entity*** $\Psi_{½}$ in $\mathfrak{Z}$-space.[394]

From this, we make a judgment of the main ***category*** of a ***quality*** we call **spin½ fermions**, which individual exclusive indivisible *unit* ***entity*** of locality we call one $\Psi_{½}$.
This we now call the ***Categorical Imperative*** for the existence of fermions in physics.

6.6.3.2. The Categorical Classification of Identical Spin½ Fermions in $\mathfrak{Z}$ Space

We have seen that the a priori transcendental model of the autonomous regular tetraon symmetry for each ***entity*** $\Psi_{½}$ in the fundamental ***category*** of spin½ fermions will make it possible for us to *limit* the number to sixteen *classes* of different *identical* fermions. These ***categorial*** *classes* we already have listed above in (6.473), resulting in the eight different ***quantities*** q, (6.513).
The four fractionated q's have each three colour states in all eight extra distinguishable *classes*.
Each of these individual fermions possesses two external spin½ stats:

(6.515) *progressive spin* (+) (*up*), and *retrograde spin* (−) (*down*).

Traditional this is just called *spin up* or *spin down*. This so-called spin state does not give the individual fermions $\Psi_{½}$ any new internal property (only a frameshift of two orientations).
Therefore, we only have these sixteen *classes* of different *identical* fermions.
When the spin stats is considered, we have 32 possible states. When their mutual external interactions are considered, we get myriads of states.

6.6.4. The Idea of One Interaction *Direction*

In both the above treated cases we essentially only have one ***direction*** of interaction at the time:
The cases of external spin ***direction*** $\pm\frac{1}{2}\boldsymbol{i}_3 \leftarrow \pm\frac{1}{2}\hbar\boldsymbol{i}\mathbf{e}_3$, and the other autonomous regular tetraon idea where the projection ***direction*** is the communication ***direction*** to the external surroundings.
The analyse above is that the projection ***direction*** is completely free from situation to situation.

6.6.4.1. The One Whole *Quantity* Charged Fermion

Choosing the carried charge ***quantity*** to one whole $q = \pm 1$. We take the electron case $q = -1$.
We look at the idea of the internal autonomy regular tetraon frame $\{\mathbf{u}_0, \mathbf{u}_1, \mathbf{u}_2, \mathbf{u}_3\}$ fulfilling (6.460).
We take similar to § 6.5.10.5 $\overrightarrow{\mathrm{AB}}$ the external $\mathbf{e}_3$ lab interaction in the ***direction*** $\mathbf{u}_3 \leftarrow \hbar\mathbf{e}_3$ and write by (6.513) the internal charge ***quantity*** cargo as

$$q = \mathbf{u}_3 \sum_{\mu=0}^{3} P_{\mathbf{u}_3}\left(\pm\tfrac{1}{2}\mathbf{u}_\mu\right) = -\tfrac{1}{2}\mathbf{u}_3\mathbf{u}_3^{-1} + \mathbf{u}_3 P_{\mathbf{u}_3}\left(+\tfrac{1}{2}\mathbf{u}_0, +\tfrac{1}{2}\mathbf{u}_1, +\tfrac{1}{2}\mathbf{u}_2\right) = -\tfrac{1}{2} + \left(-\tfrac{1}{6} - \tfrac{1}{6} - \tfrac{1}{6}\right) = -1. \tag{6.516}$$

We see that we have the half *spin down* component $-\frac{1}{2}$ or just external $\left(-\frac{1}{2}\mathbf{u}_3 \leftarrow -\frac{1}{2}\hbar\mathbf{e}_3\right)$ plus an internal three tetrahedron faced oscillation[395] as a backup for that spin½ inside one electron fermion.
The external half *spin up* situation is achieved by assuming the opposite orientation $\mathbf{u}_3 \leftarrow -\hbar\mathbf{e}_3$, using the same internal *sinistral* volume chirality, resulting in the same charged ***quantity*** $q = -1$.
Removing the ***direction*** compensating factor in (6.516) gets one whole for the angular momentum

$$-\tfrac{1}{2}\mathbf{u}_3 + \left(-\tfrac{1}{6} - \tfrac{1}{6} - \tfrac{1}{6}\right)\mathbf{u}_3 = \left(-\tfrac{1}{2}\mathbf{u}_3\right) + \left(-\tfrac{1}{2}\mathbf{u}_3\right) = -1\mathbf{u}_3 \leftarrow \mp\hbar\mathbf{e}_3, \qquad (\text{presuming } \boldsymbol{\sigma}_3 \parallel -\mathbf{u}_3), \tag{6.517}$$

[394] These three • dot objectives are the three judgements for ***quality*** in Kant's category table: *reality*, *negation*, and *limitation*.
[395] Once again for my conviction, I associate an intuition with the three ⅄ phases △ of an alternating current power supply.[378]

as a 1-vector $\vec{L}_3^{\pm} = \pm\boldsymbol{\sigma}_3 \leftarrow \pm\hbar\mathbf{e}_3$, that is exactly the angular momentum of the interaction subtons[396] with the surroundings. The information of the subton lay in its dual transversal plane

$$\mathrm{L}_3^{\pm} = \boldsymbol{i}\vec{L}_3^{\pm} = \pm\boldsymbol{i}\boldsymbol{\sigma}_3 = \pm\boldsymbol{i}_3 \quad \leftarrow \pm\hbar\boldsymbol{i}\mathbf{e}_3, \tag{6.518}$$

which wavefunction we express by its autonomous angular development parameter $\phi_s = \omega_s t$, as

$$\hat{\psi}_{3\pm} = |1, \pm 1\rangle_3 = e^{\pm\boldsymbol{i}_3\phi_s}, \tag{6.519}$$

This autonomy chronometric angular development possesses ***one quantum*** of angular momentum $1\hbar = 1$, both for the one fermion ***entity*** $\Psi_{½}$ and all the external interacting radio subtons $\Psi_{\pm\omega_s}$.
The huge difference between these two is their energy frequencies $|\omega_{¼}| \sim ½mc^2/\hbar \ggg |\omega_s|$.
Taking the internal electron four oscillation components (6.486) playing in music quartet (6.487) -

$$\psi_{\mu\pm}^{½} \sim \varrho_\mu e^{\pm½\boldsymbol{i}\mathbf{u}_\mu\varphi_\mu} = \varrho_\mu\left(\cos ½\varphi_\mu \pm \boldsymbol{i}\mathbf{u}_\mu \sin ½\varphi_\mu\right), \tag{6.520}$$

choosing the interaction ***direction*** to the surroundings $\mathbf{u}_3$ we have spin½ playing an instrument

$$\psi_{3-}^{½} \sim \varrho_3 e^{-½\boldsymbol{i}\mathbf{u}_3\varphi_3} = \varrho_3\left(\cos ½\varphi_3 - \boldsymbol{i}\mathbf{u}_3 \sin ½\varphi_3\right), \qquad \text{(sinistral, } \textbf{\textit{outwards}} \text{ retograde).} \tag{6.521}$$

For the remaining three playing instruments oscillating along the remaining tetrahedron faces of the regular tetraon symmetry

$$\psi_{\mu+}^{½} \sim \varrho_\mu e^{+½\boldsymbol{i}\mathbf{u}_\mu\varphi_\mu} = \varrho_\mu\left(\cos ½\varphi_\mu + \boldsymbol{i}\mathbf{u}_\mu \sin ½\varphi_\mu\right), \text{ for } \mu = 0,1,2. \quad (\textbf{\textit{outwards}} \text{ progressive).} \tag{6.522}$$

These three instruments can sporadically play in a unison harmony adding up in

$$\psi_{\triangle+}^{½} \sim \varrho_\triangle e^{-½\boldsymbol{i}\mathbf{u}_3\varphi_\triangle} = \varrho_\triangle\left(\cos ½\varphi_\triangle - \boldsymbol{i}\mathbf{u}_3 \sin ½\varphi_\triangle\right), \qquad (\textbf{\textit{inwards}} -\mathbf{u}_3 \text{ progressive).} \tag{6.523}$$

The three dialectic complementary angular momenta to (6.522) each contributes with $-\frac{1}{6}\mathbf{u}_3$ adding up to the backup part $\left(-\frac{1}{2}\mathbf{u}_3 \leftarrow -\frac{1}{2}\hbar\mathbf{e}_3\right)$ to the spin½ part $\left(-\frac{1}{2}\mathbf{u}_3 \leftarrow -\frac{1}{2}\hbar\mathbf{e}_3\right)$.
Now we doubt in the ambiguity of which of those possess the spin½ property or do they both.

To avoid all religious beliefs, we will abstain to use the idea of a static (eternal) electric field of momentane infinity from the electron charge. By this, the impact of one local electron fermion has lost its classical electric field as its first cause (first approximation)! What then? For the idea of one free electron ***entity*** $\Psi_{½}$ in physical space it will (what we now know) interact with the angular momentum of the background radiation and turn its spin½ in that ***direction***. We have guessed to know (and also confirmed by measurement) that the background radiation has almost isotropic distributed angular momentum ***directions*** so that the spin½ ***direction*** of the electron is turned in all ***directions*** with a frequency distribution similar to the fluctuating background radiation if the electron is free in all other aspects.

6.6.4.2. The Field of Information About one Charge

Our experience tells us that the electron has an electric charge. We have defined it as negative.
The analyse above shows the electron then has an ***outwards*** sinistral chirality ***direction*** of its spin½.
This charge quantity of the electron has no specific ***direction***, so it must be ***categorised*** as a scalar.

Above we have created the *synthetic judgment*, that the electron ***entity*** $\Psi_{½}$ has autonomy.
From this we have the *analytic judgment*, that charged ***quantity*** $q = -1$ is an internal ***quality*** of electrons. How is the information about the action of this charge transmitted to the surroundings?

The only issue we have made for this is the fundamental idea of plane angular momentum.
The angular area chronometric development is dependent on a chronometer-clock. We cannot use the internal oscillator clocks of the electron that is as an a priory transcendental ***quality*** external hidden for all other ***entities*** (including us) in the surroundings (except as an abstract ***quantity*** concept we call *rest mass*). What is not hidden, is the angular momentum.
In principle, we are free to choose any lab clock we want as the chronometer. (as in § I. 1.1,p.32).

[396] The idea of subtons is introduced in § I. 3.4.1.5 etc. and reviewed in 6.4.9.1, 6.5.3, and 6.5.6.2.