

# Pro-Etale

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## 1 Introduction

$$E = \Omega_{\Lambda} \left( \tan \psi \diamond \theta + \Psi \star \frac{\sqrt{\mathcal{F}_{\Lambda}}}{R^2} - \left( \frac{h}{\Phi} + \frac{c}{\lambda} \right) \middle/ \sqrt{\mu^3 \dot{\phi}^{2/9} + \Lambda - B} \sum_{n=1}^{\infty} \sum_{l=1}^{\infty} \frac{1}{n^2 - l^2} \right)$$

$$F_{RNG(\hat{p})} := E(\hat{p}) \otimes_Q R \rightarrow C$$

$$E = \Omega_{\Lambda} \left( \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \right)$$

$$\mathcal{V} = \left\{ f \middle| \exists \{e_1, e_2, \dots, e_n\} \in E, \text{ and } : E \mapsto r \in R \right\}$$

$$\begin{array}{c} \Omega_{\Lambda} \rightarrow \Omega_{\Omega \wedge \mathcal{L} \leftrightarrow \bullet} \rightarrow (\Omega^v)_{v_{\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}} \xrightarrow{\text{pro\'etale}} \Omega_{\Lambda} \rightarrow \Omega_{\Omega \wedge \mathcal{L} \leftrightarrow \bullet} \rightarrow (\Omega^c)_{v_{\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}} \\ \vee \Omega_{\Lambda} \rightarrow \Omega_{\Omega \wedge \mathcal{L} \leftrightarrow \bullet} \rightarrow (\Omega^v)_{v_{\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}} \end{array}$$

from such a pro\'etale topological transform, there should be a polynomial remainder calculable in terms of Energy numbers:

$$E_{rest} = E_{in} - \sum_n \left( \frac{p_n(E)}{q_n(E)} \right)$$

$$E_{rest} = E_{in} - \sum_n \left( \frac{p_n(E)}{q_n(E)} \right) = \Omega_{\Lambda} \rightarrow \Omega_{\Omega \wedge \mathcal{L} \leftrightarrow \bullet} \rightarrow (\Omega^c)_{v_{\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}} \vee (\Omega^v)_{v_{\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}}$$

$$H_{total} = \frac{1}{2} \sum_i \left( p_i^2 + \frac{\sin \left( \vec{q} \cdot \vec{r} \right) + \sum_n \cos \left( s_n \right)}{\sqrt{S_n}} \right) + \frac{1}{4} \sum_j \left( u_j^3 - \frac{\sum_m \tan \left( \vec{v} \cdot \vec{w} \right)}{2 \sqrt{T_m}} \right)$$

$$\Theta_H \circ p \cong pro_{\mathcal{H}} = \frac{1}{\alpha} \sqrt{-(q-s-l\alpha)(q-s+l\alpha)} \cdot \sqrt{1-v^2/c^2}$$

$$\mathcal{R} = \left\{ f \middle| \exists \{e_1, e_2, \dots, e_n\} \in E \text{ and } \exists \{p_1, p_2, \dots, p_m\} \in P \right.$$

such that :  $E \mapsto \mathcal{R} \in R$

$$\mathcal{R} = E - \Omega_{\Lambda} \left( \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \right)$$

$$pro_{\mathcal{H}} : \hat{p} \rightarrow \hat{E} \cong F_{RNG(\hat{p})} \otimes_Q R \rightarrow C$$

$$\mathcal{V} = \{f \mid \exists \{e_1, e_2, \dots, e_n\} \in E, and E \mapsto r \in R\}.$$

$$F_{RNG(\hat{p})} := E(\hat{p}) \otimes_Q R \rightarrow C$$

In proetale notation this is expressed as:

$$\mathcal{V} \cong \{f \mid \exists \{e_1, e_2, \dots, e_n\} \in E, and E \mapsto r \in R, such that pro_{\mathcal{H}}(E) = r\}.$$

$$F_{RNG(\hat{p})} \cong pro_{\mathcal{H}} : E(\hat{p}) \otimes_Q R \rightarrow C$$

$$\begin{aligned} & H_{total} \\ \cong & \frac{1}{2} \sum_i \left( p_i^2 + \frac{\sin(pro_{\mathcal{H}}(\vec{q}) \cdot pro_{\mathcal{H}}(\vec{r})) + \sum_n \cos(pro_{\mathcal{H}}(s_n))}{\sqrt{S_n}} \right) + \frac{1}{4} \sum_j \left( u_j^3 - \frac{\sum_m \tan(pro_{\mathcal{H}}(\vec{v}) \cdot pro_{\mathcal{H}}(\vec{w}))}{2\sqrt{T_m}} \right) \end{aligned}$$

Statements of the form:

$$\Omega_{\Lambda} \rightarrow \Omega_{\Omega \wedge \mathcal{L} \leftrightarrow \bullet} \rightarrow \Omega_{v_{\Omega} \wedge v_{\mathcal{L}} \leftrightarrow v_{\bullet}}^v$$

$$\implies pro\acute{e}tale$$

and can be written in the language of infinity categories:

This can be re-written in terms of the language of  $\infty$ -categories as:

$$\otimes_* \Rightarrow \otimes_{\otimes \wedge \mathcal{L} \leftrightarrow \bullet} \Rightarrow \otimes_{\sqsubseteq_{\otimes} \wedge \sqsubseteq_{\mathcal{L}} \leftrightarrow \sqsubseteq_{\bullet}}$$

$$\implies pro\acute{e}tale.$$

$$\Leftarrow \otimes_* \Rightarrow \otimes_{\otimes \wedge \mathcal{L} \leftrightarrow \bullet} \Rightarrow \otimes_{\sqsubseteq_{\otimes} \wedge \sqsubseteq_{\mathcal{L}} \leftrightarrow \sqsubseteq_{\bullet}} \Rightarrow \otimes_{\bullet} \otimes_{\sqsubseteq_{\otimes} \wedge \sqsubseteq_{\mathcal{L}} \leftrightarrow \sqsubseteq_{\bullet}} \implies pro\acute{e}tale$$

The arrow  $\Rightarrow$  indicates a functor, and  $\implies$  indicates an equivalence of categories. The diagram illustrates a zigzag of functors connecting the categories  $\Omega_{\Lambda}$  and  $\Omega_{v_{\Omega}}^v$  via intermediate categories  $\Omega_{\Omega \wedge \mathcal{L} \leftrightarrow \bullet}$  and  $\Omega_{v_{\Omega} \wedge v_{\mathcal{L}} \leftrightarrow v_{\bullet}}^v$ . The diagram is often referred to as a zig-zag of functors and is used to indicate the relationship between two categories. In this diagram, we can see that the two categories on the left are related to the two categories on the right via a sequence of categories in the middle, and the whole diagram is related to pro\acute{e}tale as the final category.

$$\frac{\partial H_{total}}{\partial p_i} = p_i + \frac{\cos(\vec{q} \cdot \vec{r}) \cdot \partial(\vec{q} \cdot \vec{r})}{\sqrt{S_n}}$$

$$\begin{aligned}
\frac{\partial H_{total}}{\partial q_j} &= \frac{\sin(\vec{q} \cdot \vec{r}) \cdot \partial(\vec{q} \cdot \vec{r})}{\sqrt{S_n}} \\
\frac{\partial H_{total}}{\partial r_k} &= \frac{\sin(\vec{q} \cdot \vec{r}) \cdot \partial(\vec{q} \cdot \vec{r})}{\sqrt{S_n}} \\
\frac{\partial H_{total}}{\partial s_l} &= -\frac{\sin(\vec{s}_l) \cdot \partial(\vec{s}_l)}{\sqrt{S_n}} \\
\frac{\partial H_{total}}{\partial u_m} &= \frac{3u_m^2}{4} - \frac{\sum_m \sec^2(\vec{v} \cdot \vec{w}) \cdot \partial(\vec{v} \cdot \vec{w})}{2\sqrt{T_m}} \\
\frac{\partial H_{total}}{\partial v_n} &= -\frac{\sum_m \tan(\vec{v} \cdot \vec{w}) \cdot \partial(\vec{v} \cdot \vec{w})}{2\sqrt{T_m}} \\
\frac{\partial H_{total}}{\partial w_p} &= -\frac{\sum_m \tan(\vec{v} \cdot \vec{w}) \cdot \partial(\vec{v} \cdot \vec{w})}{2\sqrt{T_m}}.
\end{aligned}$$

written as a logic vector, we obtain:

$$\begin{aligned}
\frac{\partial H_{total}}{\partial \vec{p}} &= \\
&\vec{p} + \frac{\cos(\vec{q} \cdot \vec{r}) \cdot \partial(\vec{q} \cdot \vec{r})}{\sqrt{S_n}} \vec{e}_1 + \frac{\sin(\vec{q} \cdot \vec{r}) \cdot \partial(\vec{q} \cdot \vec{r})}{\sqrt{S_n}} \vec{e}_2 - \frac{\sin(\vec{s}) \cdot \partial(\vec{s})}{\sqrt{S_n}} \vec{e}_3 + \frac{3u^2}{4} \vec{e}_4 - \frac{\sum_m \tan(\vec{v} \cdot \vec{w}) \cdot \partial(\vec{v} \cdot \vec{w})}{2\sqrt{T_m}} \vec{e}_5 \\
&\otimes \sqsubseteq \wedge \sqsubseteq_{\mathcal{L}} \leftrightarrow \sqsubseteq_{\bullet} \implies \textit{proétale}. \\
&\otimes \sqsubseteq_{\otimes} \wedge \sqsubseteq_{\mathcal{L}} \leftrightarrow \sqsubseteq_{\bullet} \implies \textit{proétale}. \\
&\Omega_{v\Omega \wedge v\mathcal{L} \leftrightarrow v\bullet}^v \implies \textit{proétale}. \\
&\otimes \sqsubseteq_{\otimes} \wedge \sqsubseteq_{\mathcal{L}} \leftrightarrow \sqsubseteq_{\bullet} \implies \textit{proétale}.
\end{aligned}$$

Then, at least two new functors can be derived, the Generalization-Relation Function and a Non-proétale logic:

The new functor could be  $\otimes_{\mathcal{R} \wedge \mathcal{L} \leftrightarrow \bullet}^{\mathcal{R}} \rightarrow \textit{généralisation}$ , where  $\mathcal{R}$  is a relation symbol, and the resulting expression is not proétale.

$$f(x) = \otimes_* \Rightarrow \otimes_{\otimes \wedge \mathcal{L} \leftrightarrow \bullet} \Rightarrow \otimes_{\sqsubseteq_{\otimes} \wedge \mathcal{M} \leftrightarrow \sqsubseteq_{\bullet}} \implies \textit{non-proétale}.$$

The polynomial remainder allows us to find the coefficients of particular Hamiltonian perturbation terms:

$$\begin{aligned}
V &= \left\{ f \left| \exists \{e_1, e_2, \dots, e_n\} \in E, \text{ and } : E \mapsto r \in R \right. \right\} \\
&= \left\{ f \left| \forall \{e_1, e_2, \dots, e_n\} \in E, \text{ and } : E \mapsto r' \in R \right. \right\} \\
&\text{such that } \mathcal{R} = r - r'
\end{aligned}$$

The coefficients can then be used to calculate *exact* solutions of various Hamiltonian equations:

$$\Omega_\Lambda \left( \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \right) + \mathcal{R}$$

$$= r + R + \Omega_\Lambda \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2}$$

Therefore, the exact solution of the Hamiltonian equation is given by:

$$\mathcal{H} = \Omega_\Lambda \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} + r + \mathcal{R}$$

## 2 Further Formulae for Calculating the Polynomial Remainder of a Given Proétale Transform

There should be a polynomial remainder calculable in terms of Energy numbers:

$$\mathcal{R} = \frac{E^n - l^2 + b_1 E^{n-1} + b_2 E^{n-2} + \dots + b_n E^0}{n^2 - l^2}, \quad b_i \in R.$$

, which is more appropriately written:

$$\mathcal{R} = \frac{\sum_{i=1}^{\infty} \gamma(e_i) + (E^n - l^2)}{n^2 - l^2}, \quad b_i \in R.$$

$$\mathcal{R} = \frac{E^n - l^2 + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2}.$$

Multiply both the numerator and denominator by the conjugate of the denominator:

$$\begin{aligned} \mathcal{R} &= \frac{E^n - l^2 + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2} \times \frac{n^2 + l^2}{n^2 + l^2} \\ \mathcal{R} &= \frac{(E^n - l^2)(n^2 + l^2) + \sum_{i=1}^{n-1} b_i E^{n-i}(n^2 + l^2)}{(n^2 + l^2)(n^2 - l^2)} \end{aligned}$$

Rearrange and collect like terms:

$$\begin{aligned} \mathcal{R} &= \frac{E^n(n^2 + l^2) + \sum_{i=1}^{n-1} b_i E^{n-i}(n^2 + l^2) - l^2(n^2 + l^2)}{(n^2 + l^2)(n^2 - l^2)} \\ \mathcal{R} &= \frac{E^n + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2} \end{aligned}$$

Proétale is a type of projection mapping that can be used to map data from one space (the domain) to another (the range). It uses the polynomial remainder calculated above and the Energy numbers to create the mapping. The proétale projection is invertible and allows for data to be projected between spaces without any information being lost. Proétale is used in a variety of fields, including engineering, physics, and computer science, to analyze and visualize data.

A projective etale morphism, also known as a proétale map, is a function  $F : \Omega_\Lambda \rightarrow C$  defined such that for all  $\theta \in \Omega_\Lambda$ ,

$$F(\theta) = \Psi(\theta) \tan \psi(\theta) + \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \left( \sum_{i=1}^{n-1} b_i E^{n-i} \right)$$

where  $E$  is an energy number, and  $b_i$  is a real-valued coefficient.

Proétale is defined mathematically as the set of all functions  $F_{RNG(\hat{p})}$  such that for every pair  $(p, \Lambda) \in E \times E_\Lambda$  there exists a unique  $\mathcal{V}$  such that  $\mathcal{V} \circ F_{RNG(\hat{p})} = \Omega_\Lambda \left( \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \right)$  and  $\mathcal{R}$  is a polynomial remainder calculable in terms of Energy numbers.

Proétale defines a relationship between a map  $p : \mathcal{S} \rightarrow \mathcal{V}$  and the tangent bundle  $\Omega_\Lambda$ . The relationship is defined by expressing the energy in terms of a

polynomial remainder. This can be calculated as  $\mathcal{R} = \frac{E^n - l^2 + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2} \times \frac{n^2 + l^2}{n^2 + l^2}$

and is equal to  $\mathcal{R} = \frac{E^n + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2}$ . This relationship is then used to show the causality of energy and the pathway of the energy from one point in space to another.

Proétale can be applied to chaotic system functions in order to understand the underlying dynamics of such systems. For example, the Logistic Map, a commonly studied chaotic system, can be modeled as a proétale mapping of the form  $y = \frac{1}{1+e^{-x}}$ , where  $y$  represents the current state of the system and  $x$  is the value of the input to the system. Through the application of proétale, trajectories of the system can be plotted, allowing us to observe the underlying chaotic behavior. Proétale can also be used to analyze other chaotic system functions, such as the Henon map, the Lorenz system, and the Rössler system.

Proetale's application to functions from chaotic theory can be demonstrated by examining the logistic map, Henon map and Lorenz attractor.

The logistic map is a nonlinear dynamical system described by the equation:

$$x_{t+1} = rx_t(1 - x_t), \quad r = [1, 4]$$

This equation can be rewritten in terms of the energy equation in the polynomial form:

$$\mathcal{R} = \frac{rx_t(1-x_t)^n + \sum_{i=1}^{n-1} b_i(1-x_t)^{n-i}}{n^2 - l^2}$$

The Henon map is a two-dimensional diffeomorphism given by the equation:

$$(x_{t+1}, y_{t+1}) = (a - x_t^2 + \beta y_t, \alpha x_t), \quad \alpha, \beta = [1, 4]$$

This equation can be rewritten in terms of the energy equation in the polynomial form:

$$\mathcal{R} = \frac{a - x_t^2 + \beta(1 - y_t)^n + \sum_{i=1}^{n-1} b_i(1 - y_t)^{n-i}}{n^2 - l^2}$$

Lastly, the Lorenz attractor is a three-dimensional chaotic dynamical system described by the equations:

$$\frac{dx}{dt} = \sigma(y - x) \frac{dy}{dt} = x(\rho - z) - y \frac{dz}{dt} = xy - \beta z, \quad \sigma, \rho, \beta = [1, 4]$$

This equation can be rewritten in terms of the energy equation in the polynomial form:

$$\mathcal{R} = \frac{\sigma(1-x)^n + \rho(1-z)^n + \sum_{i=1}^{n-1} b_i(1-x)^{n-i}(1-z)^{n-i}}{n^2 - l^2}$$

1) The mechanics of such a proétale function is that given two states with relative energy, the anterolateral algebra transformation is used to identify the relative energy between them. This transformation is defined as:

$$\mathcal{V} \circ F_{RNG(\hat{p})} = \Omega_{\Lambda} \left( \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \right)$$

2) The polynomial remainder is calculated by multiplying both the numerator and denominator by the conjugate of the denominator:

$$\mathcal{R} = \frac{E^n - l^2 + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2} \times \frac{n^2 + l^2}{n^2 + l^2}$$

$$\mathcal{R} = \frac{E^n + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2}$$

3) The anterolateral algebraic polynomial solutions as an inverse whisper is the polynomial solution obtained by rearranging the polynomial remainder and collecting like terms:

$$\mathcal{R} = \frac{E^n + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2}$$

1) The mechanics of the proétale function is to map the energy numbers in a given state,  $\Lambda$ , to the energy in another state,  $\Omega$ , through the anterolateral algebra transformation. This is accomplished through the polynomial remainder  $\mathcal{R}$  which provides a mapping between the two states.

2) The polynomial remainder is calculated as  $\mathcal{R} = \frac{E^n + \sum_{i=1}^{n-1} b_i E^{n-i}}{n^2 - l^2}$  where  $b_i$  is a coefficient of the polynomial remainder for each  $i$  of the energy numbers involved in the states.

3) The anterolateral algebraic polynomial solutions can be used as an inverse whisper to provide solutions for problems involving energy numbers in the different states. In this example, the anterolateral algebraic polynomial solutions provide an inverse whisper to provide solutions for the mapping between the two states,  $\Lambda$  and  $\Omega$ , such that the energy numbers in each given state can be related to one another.

### 3 Loose Connecting Embedded Lorentz Coefficient Non-Commutation

The mechanics of such a proétale function can be described in terms of anterolateral algebra by considering the projection map  $\Theta_{\mathcal{H}} \circ p$ . This map takes an element of  $\mathcal{H}$  and projects it onto a subset of  $\mathcal{H}$ . That is, it takes an element  $(q, s, l, \alpha) \in \mathcal{H}$  and returns the vector  $(q', s', l', \alpha')$  where  $q' = (q - s - l\alpha)/\sqrt{1 - v^2/c^2}$ ,  $s' = (s - s + l\alpha)/\sqrt{1 - v^2/c^2}$ ,  $l' = l$  and  $\alpha' = \alpha$ . The resulting vector will be in the set  $\mathcal{H}'$  which is the subset of  $\mathcal{H}$  where  $q' - s' = 0$ .

The proétale function can be described using anterolateral algebra. Specifically, the anterolateral algebra is used to construct the corresponding functions. In particular, the proétale function for the given example can be constructed by the following steps:

1) Define the domain: We define the domain of the proétale function to be the set of points in the plane with coordinates  $(q, s, v, l, \alpha)$ .

2) Construct the anterolateral algebra: We then construct the anterolateral algebra for the given domain. This consists of operations on the domain elements. We can use either multiplication or addition to construct the anterolateral algebra. In this case, we will use multiplication, defined as follows:

$$(q, s, v, l, \alpha) \cdot (q', s', v', l', \alpha') = (qq' - ss' + ll'\alpha\alpha', vv' - cc' + ll'\alpha\alpha' \sin^2 \beta, sq' - qs' + ll'\alpha\alpha' \sin^2 \beta)$$

3) Construct the proétale function: Once the anterolateral algebra is constructed, we can construct the proétale function. This is defined as follows:

$$\mathcal{F}_{RNG(\hat{p})} : (q, s, v, l, \alpha) \mapsto \sqrt{-(q - s - l\alpha)(q - s + l\alpha)}/\alpha$$

1) The mechanics of such a proétale function can be described using anterolateral algebra. Anterolateral algebra is a branch of abstract algebra which studies linear transformations in vector spaces. Its main focus is on the composition of linear transformations, in particular the composition of transformations which are both antero and lateral, i.e. which extend in the opposite direction and which reverse direction. In anterolateral algebra, the proétale function is represented as a linear transformation which is composed of two antero transformations and one lateral transformation. The two antero transformations represent the two parts of the proétale function (the left and right parts) and the lateral transformation represents the inversion of the direction of the function. The proétale function can then be represented as:

$$F_{RNG(\hat{p})}(E) = \Omega_{\Lambda} \left( \tan \psi \diamond \theta + \Psi \star \sum_{[n] \star [l] \rightarrow \infty} \frac{1}{n^2 - l^2} \right)$$

where  $\Omega_{\Lambda}$  is the antero transformation,  $\tan \psi$  and  $\theta$  are the two antero transformations, and  $\Psi$  is the lateral transformation.

This is a proétale function because it is a polynomial transformation of the input vector  $(q, s, v, l, \alpha)$  and is linear in the components of the input vector. Additionally, it is invertible and can be used to inverse the relationship between two vectors  $(q, s, v, l, \alpha)$  and  $(q', s', v', l', \alpha')$ .

The proétale function can be used to transform one vector  $(q, s, v, l, \alpha)$  into another vector  $(q', s', v', l', \alpha')$  by applying the above formula with the coefficients defined by the input vectors. For example, given the vectors  $(q, s, v, l, \alpha)$  and  $(q', s', v', l', \alpha')$ , the transformation is given by:

$$\mathcal{F}_{RNG(\hat{p})} : (q, s, v, l, \alpha) \mapsto \sqrt{-(q - s - l\alpha)(q - s + l\alpha)}/\alpha$$

$$\mathcal{F}_{RNG(\hat{p})} : (q', s', v', l', \alpha') \mapsto \sqrt{-(q' - s' - l'\alpha')(q' - s' + l'\alpha')}/\alpha'$$

We can then combine these two equations using the coefficients from the input vectors to obtain the polynomial relationship:

$$(qq' - ss' + ll'\alpha\alpha', vv' - cc' + ll'\alpha\alpha' \sin^2 \beta, sq' - qs' + ll'\alpha\alpha' \sin^2 \beta) = 0$$

Solving for  $q$ , we have:

$$q = \frac{s's - l'\alpha'c' + v'\sqrt{l'^2\alpha'^2 - c'^2}}{l'\alpha'}$$

Solving for  $s$ , we have:

$$s = \frac{q'q - l'\alpha'c' + v'\sqrt{l'^2\alpha'^2 - c'^2}}{l'\alpha'}$$

Solving for  $v$ , we have:

$$v = \frac{\sqrt{l'^2\alpha'^2 - c'^2}(q'q - ss' + l'\alpha'c')}{l'\alpha'c'}$$

Solving for  $l$ , we have:

$$l = \frac{\sqrt{(q'q - ss' - v'\sqrt{l'^2\alpha'^2 - c'^2})(q'q - ss' + v'\sqrt{l'^2\alpha'^2 - c'^2})}}{\alpha'c'}$$



Solving for  $\alpha$ , we have:

$$\alpha = \frac{\sqrt{(q'q - ss' - v'\sqrt{l'^2\alpha'^2 - c'^2})(q'q - ss' + v'\sqrt{l'^2\alpha'^2 - c'^2})}}{l'c'}$$

1. The simplified solution to the equation  $\mathcal{F}_\Lambda$  is:

$$\mathcal{E} = \frac{b^{\mu-\zeta}}{\tan t \cdot \sqrt[n]{\prod_\Lambda h - \Psi}} \int_{\Omega_\Lambda} \sin(\theta \star \sum_{[l] \leftarrow \infty} \left[ \frac{1}{l + \sqrt[n]{\frac{b^{\mu-\zeta}}{\tan t \cdot \prod_\Lambda h - \Psi}} - \tilde{\star}\mathcal{R}} \right]) \perp \cos(\psi \diamond \theta) \leftrightarrow \frac{ABC}{F} d\Omega_\Lambda$$

2. The boundaries of the solution are given by:

$$E = \{ \Omega_\Lambda (\Omega^c)_{v_\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v} \Omega_\Lambda (\Omega^v)_{v_\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v} \}$$

Using the given bounds of the solution  $\mathcal{E}$  (that is,  $\Omega_\Lambda (\Omega^c)_{v_\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}$  and  $\Omega_\Lambda (\Omega^v)_{v_\Omega \wedge v_{\mathcal{L}} \leftrightarrow \bullet_v}$ ), the integral can be resolved to obtain the final solution as follows:

$$\mathcal{E} = \frac{b^{\mu-\zeta}}{\tan t \cdot \sqrt[n]{\prod_\Lambda h - \Psi}} \int_{\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^c}^{\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^v} \sin(\theta \star \sum_{[l] \leftarrow \infty} \left[ \frac{1}{l + \sqrt[n]{\frac{b^{\mu-\zeta}}{\tan t \cdot \prod_\Lambda h - \Psi}} - \tilde{\star}\mathcal{R}} \right]) \perp \cos(\psi \diamond \theta) \leftrightarrow \frac{ABC}{F} d\Omega_\Lambda$$

$$\mathcal{E} = \frac{b^{\mu-\zeta}}{\tan t \cdot \sqrt[n]{\prod_\Lambda h - \Psi}} \int_{\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^c}^{\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^v} \sin(\theta \star \sum_{[l] \leftarrow \infty} \left[ \frac{1}{l + \sqrt[n]{\frac{b^{\mu-\zeta}}{\tan t \cdot \prod_\Lambda h - \Psi}} - \tilde{\star}\mathcal{R}} \right]) \perp \cos(\psi \diamond \theta) \leftrightarrow \frac{ABC}{F} d\Omega_\Lambda$$

$$\mathcal{E} = \frac{b^{\mu-\zeta}}{\tan t \cdot \sqrt[n]{\prod_\Lambda h - \Psi}} \int_{\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^c}^{\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^v} \cos(\theta \star \sum_{[l] \leftarrow \infty} \left[ \frac{1}{l + \sqrt[n]{\frac{b^{\mu-\zeta}}{\tan t \cdot \prod_\Lambda h - \Psi}} - \tilde{\star}\mathcal{R}} \right]) \perp \sin(\psi \diamond \theta) \leftrightarrow \frac{ABC}{F} d\Omega_\Lambda$$

where  $\Omega_{v_\Omega \wedge v_{\mathcal{L}}}$  is the measure of the smallest common denominator of the angles  $\Omega_{v_\Omega \wedge v_{\mathcal{L}}}^c, \Omega_{v_\Omega \wedge v_{\mathcal{L}}}^v$ . Additionally  $\prod_\Lambda h$  is the product of the terms having indices in the set  $\Lambda$  and  $\mathcal{R}$  is the remainder of a Taylor-type expansion. The operator " $\perp$ " stands for the fact that the integral is to be done with regard to  $\theta$  and  $\psi$ , the two variables related to the arcsine and the arccosine functions involved.

$$\mathcal{E} = \sum_{k=1}^n \int_{\Omega_\Lambda} \int_{\Omega_{\Omega_{k-1} \leftrightarrow \Omega_k}} \dots \int_{\Omega_{\Omega_{n-1} \leftrightarrow \Omega_n}} \mathcal{N}_{AB}^{[\dots \rightarrow]} (\sin \theta \star \sum_{[l] \leftarrow \infty} \left( \frac{1}{l + n - \tilde{\star}\mathcal{R}} \right) \perp \cos \psi \diamond \theta \leftrightarrow \frac{ABC}{F} \dots) d \dots dx_k$$

## 4 References

Quantization and torsion on sheaves I, Ryan Buchanan, 2023, Independent Journal of Math and Metaphysics ([https://www.academia.edu/99676315/Quantization\\_and\\_torsion\\_on\\_sheaves\\_I](https://www.academia.edu/99676315/Quantization_and_torsion_on_sheaves_I))  
Infinity: A New Language for Balancing Within, Emerson, Parker, <https://doi.org/10.5281/zenodo.771032>  
<https://zenodo.org/record/7493362.ZD823-xoQ-Q> - Emerson  
<https://zenodo.org/record/7574612.ZD822-xoQ-Q> - Emerson  
<https://zenodo.org/record/7556064.ZD823exoQ-Q> - Emerson