The E8 Charge Space and Carnatic Music
Connections in Information Space through Metahomeomorphism

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Abstract

The concept of metahomeomorphism, mapping all n-dimensional information systems can be put to good use in enhancing the visualization of the E8 model particles. This is done by mapping the charge space to a music based information system with the same number of dimensions.

Introduction – The E8 Theory:

It is seen that while equating uncertainty of quantum mechanics with the practical randomness of chaos theory, the interpretation of quantum mechanics using chaos theory can be used in conjunction with the computational universe model, which equates the action of computational 'matter' (defined by the angle of phase shift (scattering) that a qubit undergoes on passing through each quantum gate), and the action of gravitation of spacetime geometry, according to the Einstein Regge Equations $\sum_h \frac{\delta A_h}{\delta g_{ab}} g_{ab}(l) = 16\pi G U \Delta V_l = 16\pi \hbar G \theta_l$ [57]. This concept, along with the principle of metahomeomorphism, which states that all n-dimensional informational fields are equivalent in information space, leads to an important result.

The E8 Theory of Everything unifies the fields of gravity and the standard model as an E8 principal bundle connection, illustrated, composed of a SU(3) for the strong nuclear force, SU(2)xU(1) for the electroweak, SO(3,1) for the gravitational force along with the frame Higgs and three generations of Fermions, with all the ensuing interactions and dynamics described by curvature and action over a 4D base manifold. The crux of this theory is the development of eight quantum numbers which together, identify each of the 240 roots of the E8 polytope as a fundamental particle, as shown in Fig. 1 and 2. Thus, in essence, the intricate interaction of the beautiful E8 with the fabric of spacetime crystallizes into 8 kinds of charges in the charge space. These 8 charges are defined for every point in spacetime, since the E8 is present in every point of

spacetime. From basic definitions, it is known that any function (in this case, charge) varying with space and time is a "signal". So, the 8 charges are seen as 8 signals - signals of information. Using the Chaotic Interpretation, the superposed state of a quantum system, such as a qubit, is nothing but a chaotic signal. The chaotic nature is destroyed once the qubit collapses to a 0 or 1. The initial conditions already determine which of the 2 options (0 or 1) the qubit will collapse into, once we 'measure' it. For a 2 qubit system, represented by 2 chaotic signals with entanglement, there are 4 main states (00,01,10,11) and any entangled state can be formed by combining the 4 states in suitable proportions. Similarly, 3 chaotic signals, representing 3 qubits can have 8 fundamental states (000,001,010,011,100,101,110,111) using which entangled states can be constructed.Thus, given 8 columns of data, according to metahomeomorphism, one can represent them as the combining factors of the 8 states, and represent these 8 states as entangled states of a 3-qubit system. According to the chaotic interpretation, the 3 Qubits are 3 chaotic signals representing information, as the 8 states.
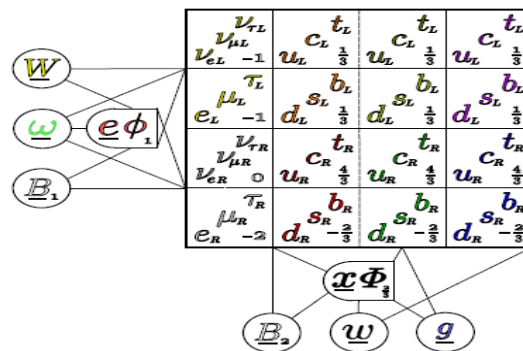

Figure 1 Periodic Table of the E8 ToE

E8	$\frac{1}{2i}\omega_T^3$	$\frac{1}{2}\omega_S^3$	U^3	V^3	w	x	y	z	$F4$	$G2$	$\#$
$\omega_L^{\wedge/\vee}\;\;\omega_R^{\wedge/\vee}$	±1	±1	0		0				$D2_G$	1	4
$W^{\pm}\;\;B_1^{\pm}$	0		±1	±1	0				$D2_{ew}$	1	4
$e\phi_+\;\;e\phi_-\;\;e\phi_1\;\;e\phi_0$	±1		±1		0				4×4	1	16
$\nu_{eL}\;\;e_L\;\;\nu_{eR}\;\;e_R$	$\pm1/2\ \dots\ \mathrm{even}\#>0$				$-1/2$	$-1/2$	$-1/2$	$-1/2$	8_{S+}	l	8
$\bar\nu_{eL}\;\;\bar e_L\;\;\bar\nu_{eR}\;\;\bar e_R$	$\pm1/2\ \dots\ \mathrm{even}\#>0$				$1/2$	$1/2$	$1/2$	$1/2$	8_{S+}	$\bar l$	8
$u_L\;\;d_L\;\;u_R\;\;d_R$	$\pm1/2\ \dots\ \mathrm{even}\#>0$				$-1/2$	$\pm1/2\ \dots\ \mathrm{two}>0$			8_{S+}	q_I	24
$\bar u_L\;\;\bar d_L\;\;\bar u_R\;\;\bar d_R$	$\pm1/2\ \dots\ \mathrm{even}\#>0$				$1/2$	$\pm1/2\ \dots\ \mathrm{one}>0$			8_{S+}	$\bar q_I$	24
$\nu_{\mu L}\;\;\mu_L\;\;\nu_{\mu R}\;\;\mu_R$	$\pm1/2\ \dots\ \mathrm{odd}\#>0$				$-1/2$	$1/2$	$1/2$	$1/2$	8_{S-}	l	8
$\bar\nu_{\mu L}\;\;\bar\mu_L\;\;\bar\nu_{\mu R}\;\;\bar\mu_R$	$\pm1/2\ \dots\ \mathrm{odd}\#>0$				$1/2$	$-1/2$	$-1/2$	$-1/2$	8_{S-}	$\bar l$	8
$c_L\;\;s_L\;\;c_R\;\;s_R$	$\pm1/2\ \dots\ \mathrm{odd}\#>0$				$1/2$	$\pm1/2\ \dots\ \mathrm{two}>0$			8_{S-}	q_I	24
$\bar c_L\;\;\bar s_L\;\;\bar c_R\;\;\bar s_R$	$\pm1/2\ \dots\ \mathrm{odd}\#>0$				$-1/2$	$\pm1/2\ \dots\ \mathrm{one}>0$			8_{S-}	$\bar q_I$	24
$\nu_{\tau L}\;\;\tau_L\;\;\nu_{\tau R}\;\;\tau_R$	±1				1	0			8_V	1	8
$\bar\nu_{\tau L}\;\;\bar\tau_L\;\;\bar\nu_{\tau R}\;\;\bar\tau_R$	±1				-1	0			8_V	1	8
$t_L\;\;b_L\;\;t_R\;\;b_R$	±1				0	-1			8_V	q_{II}	24
$\bar t_L\;\;\bar b_L\;\;\bar t_R\;\;\bar b_R$	±1				0	1			8_V	$\bar q_{II}$	24
g	0				0	1	-1		1	$A2$	6
$x_1\Phi$	0				-1	±1			1	q_{II}	6
$x_2\Phi$	0				1	±1			1	q_{II}	6
$x_3\Phi$	0				0	$\pm(1\ \ 1)$			1	q_{III}	6

Figure 2 Periodic Table of the E8 ToE

E8 Theory and Carnatic Music – A Metahomeomorphic Link

The concept of metahomeomorphism, mapping all n-dimensional information systems can be put to good use in enhancing the visualization of the E8 model particles. This is done by mapping the charge space to a music based information system with the same number of dimensions, as highlighted in the following slides:

- The Dimensions of Carnatic Music refer to the number of orthogonal coordinates required to uniquely represent a Raga (Melody).
- Dimensions can be classified into
- 1. Structural – Arising from the Swaras and their types.
- 2. Functional – Arising from the effects of music on the body, mind and soul.

- Carnatic music has 7 Notes (Swaras) of which:
- 1. Sa and Pa are Achala (fixed). These are technically 'hidden' dimensions. We will exclude them in our formulation.
- 2. Ri, Ga, Ma, Dha and Ni can have one of two Swarasthanas (Komal/Tivra). Thus 5 Dimensions, one for each of the 5 Swaras.

- 1. Physiological – according to Ayurvedic constructs, can be codified into 3 dimensions - Airiness (Vaata), Fieriness (Pitta) and Heaviness (Kapha).
- 2. Emotional - 2 Dimensions – Valence and Arousal.
- 3. Sociological – Temperament – defined by 4 cardinal MBTI dimensions – Introversion, Intuition, Feeling and Perception.
- 4. Psychological – 1D of Brainwave Frequency.
- 5. Spiritual – 7D representing the 7 Chakras, but these have already been included in the structural dimensions.

Thus a total of 11 functional dimensions and 5 structural dimensions – 16 dimensions.

- We can use this OmiChaotic construct of Carnatic Music (16D) or any subset of it to 'access' the corresponding dimensional information field.
- As an example, the 5 structural dimensions of Carnatic music is taken. These are used to map to a reduced 5D version of the E8 theory.
- Similar procedures can be followed for any other metahomeomorphic mapping.

- We eliminate the color information in x, y and z coordinates.
- We combine the information of U, x, y and z into a single variable Q, representing charge: $Q = U+(x+y+z)/3$.
- Thus the five coordinates are S (wS), T (wT), V, w and Q.
- The order used for this construct will be Q,V,w,S,T.

- Komal Swaras are represented as -1. Tivra Swaras as 1.
- Thus any Raga can be represented using five coordinates – R, G, M, D and N.
- Example: Sarasaangi – S R2 G2 M1 P D1 N2 – represented as (1,1,1,-1,1).
- Absence of a Swara is taken as 0.
- Example: Mohanam – S R2 G2 P D2 – given as (1,1,0,1,0).

- 3 'Qubits' are used - 2 Qubits Q1 and Q2 give states |00>=R, |01>=G, |10>=D and |11>=N. Third Q3 for M.
- Ex: Sarasaangi – for 1,1,1,-1,1
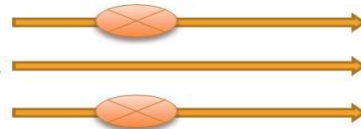
- Ex: Mohanam - for 1,1,0,1,0
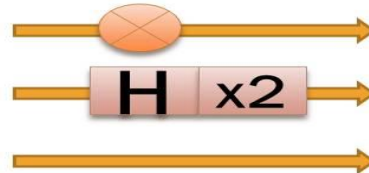
- Vivaadhi swaras are swaras belonging to neighbouring Swarasthanas – Ex: Vivaadhi Ga belongs to Ri. So it is taken as Ri.
- This implies that R1 Vivaadhi G is R1 R2. So R coordinate becomes 'entangled' due to superposed values of R, and should be denoted as 'E'. For simplicity of calculation, let us assume entanglement of Komal and Tivra as 0. Thus E=0.
- Example Jhankaradhwani: S R2 G1 M1 P D1 D2 given as (1,-1,1,E,0) or (1,-1,1,0,0).

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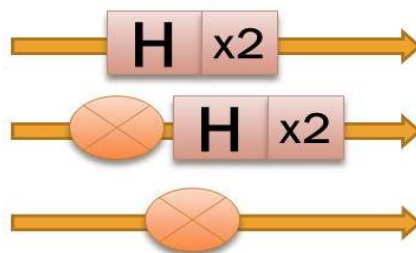
- If a Swara is present only in ascent/descent, then it takes half value. EX: MohanaKalyani – S R2 G2 P D2 – S N2 D2 P M2 G2 R2, and is given as (1,1, -1/2,1,1/2), since M and N appear only once.
- Sambamoorthy has also suggested mixing of Melakarthas. Ex: Chaaru-Bhavapriya – S R2 G2 M1 P D1 N1 – S N1 D1 P M2 G1 R1, given as (E,E,E,-1,-1) or (0,0,0,-1,-1).
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MOHANAKALYANI   CHAARU-BHAVAPRIYA
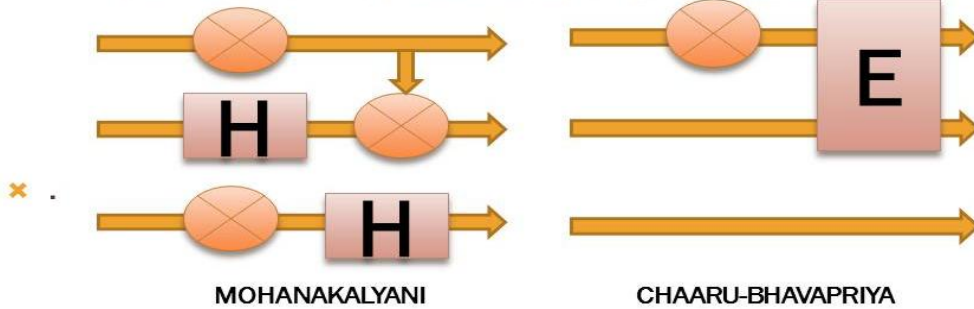
- Purvanga consists of R, G, M – 3 coordinates.
- 3 charge based coordinates of w, Q and V in 5D
- M connects Purvanga and Uttaranga. W connects F4 and G2 in E8.
- Uttaranga has 2 coordinates – D, N.
- 2 Frame based coordinates in 5D – S and T.
- Thus the mapping is R-Q, G-V, M-w, D-S and N-T.
- Now, we are ready to construct Elementary particles from 5D using Ragas.
- Since we have not used the full capacity of Raga Groups (we use only 5 out of 16D), many Ragas can be mapped to the same elementary particle.

electrons/e-neutrinos given by (Q,V,w,S,T) such as (-1,-1/2,1/2,1/2,-1/2) .

So, minimum of 2 halves, with R1 in both, and G1, M1, D2 and N1 each in exactly one half.

One such structure would be S R1 M1 P D2 – S N1 P G1 R1.

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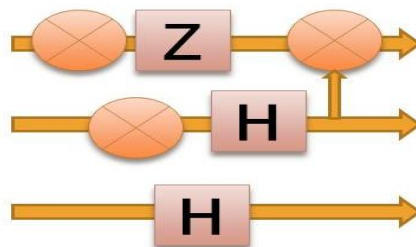
- 5D Construct is (1,0,0,1,0).
- R2 and D2 necessary in both ascent and descent. Other Swaras neutralized.
- Example using only Melakartha:
- S R2 G1 M1 P D2 N2 – S N1 D2 P M2 G1 R1 – Gauri Naatakapriya.
- Example using Janyas:
- S R2 G2 P D2 – S D2 P G1 R2 – Mishra Shivaranjani.

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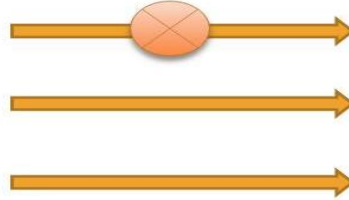
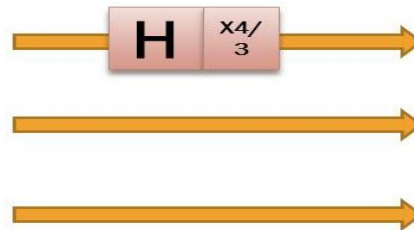- (2/3,0,0,0,0) in 5D group.
- To achieve fractions such as 2/3, we need to combine multiple Ragas.
- Ex: 3 Ragas, with R2 in 2 Ragas, No R in third, andall other Swaras Neutralized.
- Ex: A Combination of:
- S R2 G1 M2 P D2
- S G2 P D1 N1 and
- S R2 M1 P N2.

- Photon corresponds to (0,0,0,0,0).
- To achieve these, hybrid Melakarthas are used.
- Specifically, any Melakartha and its exact complement entangles all 5 coordinates, giving 0,0,0,0,0.
- Ex: Maayaa-Hemavathi – S R1 G2 M1 P D1 N2 – S N1 D2 P M2 G1 R2.