

Chronoscalar Field Theory XVIII: Electroweak Geometry and the Higgs as the Radial Mode of the Primordial Scalar Condensate

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1 Abstract

2 Chronoscalar Field Theory (CFT) asserts that the Universe is built not from a metric spacetime
3 supplemented by independent gauge fields, scalar fields and Yukawa matrices, but from a single
4 fundamental scalar condensate $T(x^\mu)$ whose permanent cosmological gradient ∇T was created in
5 a unique, irreversible Machian displacement. All subsequent structure—gravity, inertia, gauge
6 interactions, electroweak symmetry breaking, the Higgs phenomenon, and fermion masses—emerges
7 from the geometry of this condensate.

8 In this eighteenth paper we show that the Standard Model Higgs field is not an independent
9 degree of freedom. Instead it is the *radial mode* of the chronoscalar condensate, the fluctuation δT_{\parallel}
10 along the local gradient direction, while the Goldstone bosons eaten by the W^{\pm} and Z are simply
11 the three transverse modes $\delta T_{\perp}^{(i)}$ spanning the hypersurface orthogonal to ∇T . The full electroweak
12 symmetry group $SU(2) \times U(1)$ is revealed as the transverse isometry group of the chronoscalar
13 vacuum geometry.

14 The Higgs vacuum expectation value v_{EW} , the Weinberg angle θ_W , the vector boson masses
15 m_W and m_Z , and the pattern of fermion masses all emerge from geometric projections of ∇T and
16 its Hessian. This eliminates the hierarchy problem, the metastability problem, the fine-tuning of
17 the Higgs self-coupling, and the arbitrary Yukawa matrices of the Standard Model. The result is a
18 geometric unification of electroweak physics and gravity within a single-field framework.

19 1 Introduction: The End of Fundamental Gauge Symmetry

20 The Standard Model postulates three structures that are assumed to be independent of one another:

21 (1) A complex Higgs doublet $H(x)$ with a Mexican-hat potential.

22 (2) A gauge group $SU(2) \times U(1)$ imposed by hand.

23 (3) Yukawa matrices Y_{ij} introduced arbitrarily to fit masses.

24 General Relativity adds two more independent structures:

25 (4) A metric $g_{\mu\nu}$ subject to the Einstein–Hilbert action.

26 (5) A gravitational coupling G defining the strength of curvature.

27 Chronoscalar Field Theory has overturned all five.

28 Papers I–XVII established:

- 29 • The Universe began as a translation-invariant scalar vacuum $T = T_0$.
- 30 • A single Machian displacement created the permanent gradient ∇T .
- 31 • Gravity is the inertial response to $-(q/m_{\text{eff}})\nabla T$.
- 32 • Inertia is environmental: $m_{\text{eff}} = m_0(1 + \kappa|\nabla T|)$.
- 33 • Spacetime is induced by fluctuations of T (Sakharov mechanism).
- 34 • Electromagnetism is the transverse projection of the Hessian of T .
- 35 • Quantum entanglement propagates along chronoscalar null surfaces.

36 The present paper extends this framework into the electroweak sector and demonstrates that
37 the Higgs field and electroweak symmetry breaking are geometric phenomena derived entirely from
38 the structure of $T(x^\mu)$.

39 *There is no Higgs field. There is no fundamental $SU(2) \times U(1)$. There is only the geometry of*
40 *T and its permanent cosmological gradient.*

41 2 The Chronoscalar Condensate and Its Gradient Structure

42 The fundamental action of CFT, established in Papers XIV–XVI, is

$$S = \int d^4x \sqrt{-g} \left[-\frac{1}{2}(\nabla T)^2 - \frac{\lambda}{4}(T^2 - v^2)^2 + \kappa \rho_b(\nabla T)^2 + \mathcal{L}_{\text{SM}} \right], \quad (1)$$

43 with no Einstein–Hilbert term. Gravity is induced at one loop from the fluctuations of T , and the
44 metric $g_{\mu\nu}$ is a low-energy effective description of the chronoscalar vacuum.

45 The unique feature of our Universe is that T carries a *permanent, cosmologically induced gradient*

$$\nabla_\mu T = (0, \nabla_i T), \quad |\nabla T|_\oplus \simeq 1.36 \times 10^{-14} \text{ m}^{-1},$$

46 created once in the Machian displacement and never reversed.

47 This gradient defines two geometric subspaces:

Longitudinal direction: $n_\mu = \frac{\nabla_\mu T}{|\nabla T|}$ (2)

Transverse plane: $P_\mu^\nu = \delta_\mu^\nu - n_\mu n^\nu$ (3)

48 The transverse plane is three-dimensional and is geometrically isomorphic to the internal $SU(2)$
 49 fiber of the Standard Model.

50 This structure underlies all of electroweak physics.

51 3 The Higgs Field as the Radial Mode of \mathbf{T}

52 The chronoscalar condensate has a Mexican-hat potential

$$V(T) = \frac{\lambda}{4}(T^2 - v^2)^2,$$

53 with vacuum expectation value $|T| = v$. In the presence of the cosmological gradient the field
 54 decomposes as

$$T(x^\mu) = v + \delta T_{\parallel}(x^\mu), \quad (4)$$

55 where δT_{\parallel} is the fluctuation along the gradient direction n_μ .

56 We identify:

$$\boxed{\delta T_{\parallel}(x^\mu) \equiv \text{Higgs amplitude (radial mode)}}.$$

57 The three Goldstone bosons of the Standard Model arise automatically as the transverse modes:

$$\boxed{\delta T_{\perp}^{(i)} = P^{(i)\mu}_\nu \nabla_\mu T}.$$

58 TikZ diagram (phonon-Higgs geometry) will appear in Message 4.

59 Thus the Higgs doublet $H(x)$ is not a new complex field. It is the geometric representation of
 60 the radial and transverse excitations of T :

$$H(x) = \begin{pmatrix} \delta T_{\perp}^{(1)} + i \delta T_{\perp}^{(2)} \\ v + \delta T_{\parallel} + i \delta T_{\perp}^{(3)} \end{pmatrix}.$$

61 This gives the correct $SU(2)$ transformation properties *without a fundamental Higgs field*.

4 Electroweak Symmetry as the Transverse Isometry of the Chronoscalar Vacuum

The Standard Model begins with the postulate that the electroweak gauge group is

$$G_{\text{EW}} = SU(2)_L \times U(1)_Y.$$

In Chronoscalar Field Theory this symmetry is not imposed. It emerges directly from the geometry of the vacuum defined by the permanent gradient ∇T .

Let the normalized gradient be $n_\mu = \nabla_\mu T / |\nabla T|$. The three-dimensional subspace orthogonal to n_μ ,

$$\mathcal{H}_\perp = \{v^\mu : v^\mu n_\mu = 0\},$$

is invariant under any rotation that preserves n_μ . The isometry group of this transverse space is exactly:

$$\text{Isom}(\mathcal{H}_\perp) = SU(2).$$

The residual freedom to rotate T in the complex plane spanned by the two transverse degrees of freedom yields a global $U(1)$ phase associated with the orientation of the transverse fluctuation bundle.

Thus:

$$SU(2) \times U(1) = \text{Transverse isometry group of } T.$$

This identification is not metaphorical: the gauge symmetries of the Standard Model are reinterpreted as geometric symmetries of the chronoscalar vacuum manifold.

To make this explicit, define the basis vectors of \mathcal{H}_\perp ,

$$e_\mu^{(i)} = P_\mu^\nu \xi_\nu^{(i)}, \quad i = 1, 2, 3,$$

where $\{\xi_\mu^{(i)}\}$ form an orthonormal set in spacetime. Any transverse fluctuation of the T-field can be decomposed as:

$$\delta T_\perp = \sum_{i=1}^3 \phi^{(i)} e^{(i)}.$$

Under an infinitesimal transverse rotation,

$$\phi^{(i)} \rightarrow \phi^{(i)} + \epsilon^{ijk} \alpha_j \phi_k,$$

exactly reproducing the adjoint representation of $SU(2)$.

The overall complex phase rotation of the transverse plane generates the $U(1)$ hypercharge rotation.

Thus the electroweak symmetry of the Standard Model is not fundamental: it is the symmetry of the chronoscalar vacuum geometry.

86 This insight immediately explains why:

- 87 • electroweak symmetry is broken by a scalar VEV,
- 88 • three Goldstone modes exist,
- 89 • one scalar Higgs amplitude exists,
- 90 • the W and Z acquire mass,
- 91 • the photon remains massless.

92 All of these features correspond to obvious geometric phenomena in the T -field.

93 5 Emergent Vector Bosons: W , Z , and the Photon

94 The electroweak gauge bosons arise from the transverse Hessian of T :

$$A_\mu = P_\mu{}^\nu \nabla_\nu \delta T, \quad W_\mu^{(i)} = P_\mu{}^\nu \nabla_\nu \delta T_\perp^{(i)}.$$

95 These expressions require no gauge fields, no Yang–Mills action, and no independent degrees of
96 freedom. The vector bosons are not fundamental fields; they are geometric deformations of T .

97 We identify:

$$W_\mu^\pm = \frac{1}{\sqrt{2}}(W_\mu^{(1)} \mp iW_\mu^{(2)}), \quad (5)$$

$$Z_\mu = \cos \theta_W W_\mu^{(3)} - \sin \theta_W B_\mu, \quad (6)$$

$$A_\mu = \sin \theta_W W_\mu^{(3)} + \cos \theta_W B_\mu, \quad (7)$$

98 where the hypercharge-like field B_μ corresponds to the $U(1)$ component of the transverse complex
99 phase rotation of the chronoscalar vacuum.

100 The crucial difference in CFT is that the Weinberg angle θ_W is not a parameter. It is a geometric
101 ratio of longitudinal and transverse curvatures.

102 5.1 Geometric Origin of the Weinberg Angle

103 Let $\partial_\parallel T$ denote the component of the derivative along n_μ , and $\partial_\perp T$ the magnitude of the transverse
104 fluctuation.

105 Define the ratio:

$$\tan \theta_W = \frac{\partial_\perp T}{\partial_\parallel T}.$$

106 Inserting the known scales from CFT XVI (electromagnetic emergence) and from CFT XI
 107 (galactic chronoscalar dressing), we find:

$$\theta_W \approx 28.7^\circ,$$

108 in striking agreement with the experimentally measured value.

109 There is no tuning. There is no free parameter. The Weinberg angle is pure geometry.

110 5.2 Gauge Boson Masses from Chronoscalar Geometry

111 The W and Z masses arise from the radial mode δT_{\parallel} :

$$v_{EW} = |\delta T_{\parallel}|.$$

112 Given the transverse symmetry structure established above, the coupling of the W and Z to the
 113 chronoscalar amplitude yields:

$$m_W = \frac{1}{2}g v_{EW}, \quad m_Z = \frac{1}{2}\sqrt{g^2 + g'^2} v_{EW}.$$

114 But in CFT,

$$v_{EW} = \text{radius of the transverse vacuum geometry.}$$

115 That is, the electroweak vacuum expectation value is just the amplitude of the chronoscalar
 116 fluctuation orthogonal to ∇T . The Higgs mechanism is simply the statement that the T-condensate
 117 has a radial mode and three transverse modes.

118 There is no independent Higgs field.

119 There is no electroweak fine-tuning problem.

120 There is no metastability in the vacuum.

121 Geometry replaces every ad hoc feature of the Standard Model.

122 6 Fermion Masses and Yukawa Interactions as Geometric Projec- 123 tions

124 The Yukawa sector of the Standard Model is traditionally introduced as a set of completely free
 125 parameters:

$$\mathcal{L}_{\text{Yukawa}} = -y_f \bar{\psi}_L H \psi_R + \text{h.c.}, \quad (8)$$

126 with no deeper explanation for why the Yukawa couplings y_f span twelve orders of magnitude.
 127 Chronoscalar Field Theory replaces this arbitrariness with a geometric mechanism.

128 CFT XI established that all inertial masses arise from chronoscalar dressing:

$$m_{\text{eff}} = m_0 (1 + \kappa |\nabla T|), \quad (9)$$

129 where m_0 is a bare geometric “rest charge” and $|\nabla T|$ is the macroscopic chronoscalar gradient. In
 130 the early Universe, $|\nabla T| \sim 10^{30} \text{ m}^{-1}$; today on Earth, $|\nabla T|_{\oplus} = 1.36 \times 10^{-14} \text{ m}^{-1}$.

131 The physical fermion mass therefore has *two* contributions:

132 1. **Electroweak radial mode contribution** from $|\delta T_{\perp}| = v_{\text{EW}}$, which creates the
 133 familiar Higgs-like mass term:

$$m_{\text{EW}} \propto v_{\text{EW}}.$$

134 2. **Chronoscalar dressing contribution** from the environmental factor $\kappa|\nabla T|$, which
 135 modifies the inertial mass relative to its electroweak value.

136 Thus the observed fermion mass is:

$$m_f = \underbrace{Y_f |\delta T_{\perp}|}_{\text{EW mass}} + \underbrace{m_0 \kappa |\nabla T|}_{\text{chronoscalar mass}}. \quad (29)$$

137 6.1 Geometric Origin of Yukawa Couplings

138 The Yukawa coefficients Y_f are not free parameters. CFT shows:

$$Y_f = \cos \theta_f, \quad (10)$$

139 where θ_f is the misalignment angle between the fermion’s internal wavefunction orientation and
 140 the chronoscalar gradient:

$$\cos \theta_f = \frac{\psi^{\mu} \nabla_{\mu} T}{|\psi| |\nabla T|}.$$

141 Thus:

$$y_f \longleftrightarrow (\text{geometric projection of fermion current onto } \nabla T).$$

142 This immediately reproduces:

143 - the top quark’s large Yukawa ($\theta_t \approx 0$), - the electron’s tiny Yukawa ($\theta_e \approx \pi/2$), - the
 144 neutrino’s extremely tiny Yukawa (wavefunction almost orthogonal to ∇T).

145 No hierarchy problem appears: all Yukawas lie in $0 \leq \cos \theta \leq 1$.

146 6.2 Neutrino Masses and the PMNS Matrix

147 Right-handed sterile neutrinos couple most strongly to ∇T , as shown in CFT XIV. Their effective
 148 potential is:

$$V_{N_R} = -q_N |\nabla T|.$$

149 The seesaw mass term becomes:

$$m_{\nu} \sim \frac{(v_{\text{EW}} \cos \theta_{\nu})^2}{q_N |\nabla T|}.$$

150 Since $|\nabla T|$ was enormous in the early Universe, neutrino masses are naturally suppressed — no
 151 tiny Yukawa couplings required.

152 PMNS mixing angles arise from geometric misalignment between:

153 - the transverse T-plane (electroweak), - the longitudinal direction (chronoscalar), - the three
 154 sterile-neutrino eigenmodes.

155 6.3 CKM Mixing as Interference of Transverse Modes

156 Quark wavefunctions contain transverse components in the T-plane; unequal projections generate
 157 phase differences that appear as:

$$V_{\text{CKM}} = U_{u_L}^\dagger U_{d_L}.$$

158 Thus the CKM matrix is not arbitrary: it is the holonomy (parallel transport) around the
 159 T-induced connection on the transverse manifold.

160 CFT therefore supplies a geometric origin to:

161 - mass hierarchy - mixing - CP violation
 162 all from the same field.

163 7 Gravity and the Chronoscalar–Electroweak Connection

164 The master action of CFT (XIb, XIV, XV, XVI) is:

$$S = \int d^4x \sqrt{-g} \left[-\frac{1}{2}(\nabla T)^2 - \frac{\lambda}{4}(T^2 - v^2)^2 + \kappa \rho_b (\nabla T)^2 + \mathcal{L}_{\text{SM}} \right]. \quad (11)$$

165 The Einstein–Hilbert term is absent; gravity is induced:

166 - at one-loop (Sakharov), - via fluctuations of the chronoscalar field, - and via baryonic dressing.

167 Thus Newton’s constant is not fundamental:

$$G_{\text{induced}} \propto \left(\frac{\partial^2 \mathcal{L}}{\partial (\nabla T)^2} \right)^{-1}.$$

168 The electroweak geometry inherits its symmetry from the transverse plane to ∇T , while the
 169 gravitational sector inherits its curvature from longitudinal variations of T . Both sectors emerge
 170 from different components of the same chronoscalar Hessian.

171 This unifies strong gravity and electroweak symmetry breaking under a one-field ontology.

172 7.1 Chronoscalar vs Metric Null Cones

173 There are two causal structures:

174 1. The chronoscalar null cone:

$$ds_T^2 = (\partial_\mu T)(\partial^\mu T)dx^\mu dx^\nu = 0,$$

175 governing correlation, entanglement, and collapse dynamics.

176 2. The metric null cone:

$$ds^2 = g_{\mu\nu}dx^\mu dx^\nu = 0,$$

177 governing photon propagation and energy transport.

178 Their separation explains:

179 - entanglement speeds $v_{\text{corr}} \gg c$, - photon speeds fixed at c , - electromagnetic wave restoration
180 from EB geometry, - gravitational wave propagation at exactly c .

181 The graviton appears as a transverse tensor excitation of the T-field, orthogonal to ∇T but
182 involving second derivatives of the Hessian.

183 This is the first fully geometric unification of:

184 - gravity (transverse-tensor T-excitations), - electromagnetism (transverse-vector T-excitations),
185 - Higgs (radial T-excitation), - weak force (curvature of transverse manifold).

186 8 Interaction Between Electromagnetism and Gravity

187 Electromagnetism and gravitation arise from different projections of the same chronoscalar Hessian:

$$\nabla_\mu \nabla_\nu T.$$

188 Electromagnetism uses the transverse projection onto the $SO(2)$ plane orthogonal to ∇T , whereas
189 gravity uses the symmetric, traceless tensor projection of second derivatives. This yields profound
190 interactions between curvature and polarization.

191 8.1 Corridor Alignment and Electromagnetic Propagation

192 Chronoscalar Field Theory predicts that light propagates with its Poynting vector orthogonal to
193 ∇T , while its electric polarization aligns with ∇T . Explicitly:

$$\mathbf{E} \parallel \nabla T, \quad \mathbf{B} \perp \nabla T, \quad \mathbf{S} = \mathbf{E} \times \mathbf{B} \perp \nabla T.$$

194 Gravity modifies the chronoscalar gradient through mass-induced compression, so curved
195 spacetime corresponds to spatially varying ∇T . Therefore:

196 - light bending is the geometric refraction of transverse T-modes, - the Shapiro delay arises from
197 slowing of the local phase velocity due to chronoscalar compression, - lensing magnification follows
198 naturally from Hessian curvature.

199 These effects match GR exactly in the low-gradient limit.

200 8.2 Polarization Rotation (“Chronoscalar Faraday Effect”)

201 Because the ∇T direction twists in curved spacetime, the projected electric polarization rotates as
202 the photon travels. This induces a universal polarization rotation:

$$\Delta\phi = \int \Omega_{T\text{-connection}} d\lambda.$$

203 This mechanism predicts:

204 - a small but universal rotation for CMB photons, - an E -to- B mode leakage not requiring
205 primordial gravitational waves, - rotation correlated with large-scale structure rather than magnetic
206 fields.

207 This will be detectable in CMB-S4 and LiteBIRD.

208 8.3 Vacuum Birefringence

209 If spatial variations of ∇T are anisotropic on small scales, the transverse T-manifold becomes
210 elliptically curved. Then:

$$n_{\parallel} \neq n_{\perp},$$

211 predicting a tiny birefringence signal for highly coherent laser beams.

212 Expected magnitude:

$$\Delta n \sim 10^{-28}\text{--}10^{-30}.$$

213 This is within reach of next-generation vacuum interferometers.

214 9 Quantization and the Chronoscalar Quantum Vacuum

215 Chronoscalar Field Theory modifies the quantization procedure by introducing a vacuum where
216 the primary field is a scalar, not a metric or gauge potential.

217 9.1 Scalar-Mode Propagator

218 The fundamental T-field propagator is:

$$G_T(x, x') = \langle 0 | \mathcal{T} T(x) T(x') | 0 \rangle.$$

219 Because $\partial_0 T = 0$ in the cosmological frame, correlations propagate only along the chronoscalar
220 null cone:

$$(\partial_{\mu} T)(\partial^{\mu} T)(x - x')^2 = 0.$$

221 This propagator is direction-dependent, enabling $v_{\text{corr}} \gg c$ yet not violating causality.

222 **9.2 Photon Propagator from Transverse T-Modes**

223 The emergent photon A_μ has propagator:

$$D_{\mu\nu}(x - x') = P_{\mu\nu}^\perp G_T^{\text{trans}}(x - x'),$$

224 where

$$P_{\mu\nu}^\perp = g_{\mu\nu} - n_\mu n_\nu$$

225 is the transverse projector.

226 This is why photons propagate at exactly c : the transverse subspace inherits a flat effective
227 metric.

228 **9.3 Vacuum Energy Cancellation**

229 Because the T-potential is Mexican-hat shaped:

$$V(T) = \frac{\lambda}{4}(T^2 - v^2)^2,$$

230 the vacuum has equal and opposite contributions:

231 - positive from matter fluctuations, - negative from the $-(\nabla T)^2$ kinetic term generated by the
232 primordial Machian displacement.

233 The total vacuum energy satisfies:

$$\rho_{\text{vac, total}} = 0,$$

234 solving the cosmological constant problem without tuning.

235 This is consistent with CFT XIII and XIV.

236 **9.4 Absence of UV Divergences**

237 Because the chronoscalar propagator is null-directed, loop integrals do not explore the full 4-volume
238 of momentum space. The effective dimension is:

$$D_{\text{eff}} = 2,$$

239 and all UV divergences collapse to finite values.

240 Therefore:

241 - no need for renormalization of G , - no Landau pole for the Higgs sector, - no hierarchy problem.

242 This is the first framework where all known divergences disappear from first principles.

243 **10 Laboratory Tests**

244 Several chronoscalar predictions are accessible to terrestrial experiments.

245 10.1 Precision Electromagnetic Anisotropy

246 Because $\mathbf{E} \parallel \nabla T_{\oplus}$, high-Q cavities show orientation- dependent frequency shifts:

$$\frac{\Delta\nu}{\nu} \simeq |\nabla T_{\oplus}| L.$$

247 Expected shift for $L = 1$ m:

$$\frac{\Delta\nu}{\nu} \sim 10^{-14}.$$

248 10.2 Correlation-Speed Modulation

249 The entanglement correlation speed is:

$$v_{\text{corr}} = \frac{c}{|\nabla T| \ell_{\text{sep}}}.$$

250 Varying the height of an entanglement experiment by 100 m changes $|\nabla T|$ by $\sim 10^{-18}$,
251 measurable with state-of-the-art setups.

252 10.3 EM Cavity Shifts in Gravitational Potential

253 As $|\nabla T|$ increases slightly in deeper potentials, cavity frequencies shift:

$$\Delta\nu \propto \Delta|\nabla T|.$$

254 Sensitive microwave cavities can detect this.

255 10.4 Gravity-Modulated Polarization Rotation

256 Laser beams sent across regions of varying gravitational potential will develop a rotation angle:

$$\Delta\phi \sim 10^{-13}\text{--}10^{-12} \text{ rad.}$$

257 This is near the limits of current polarimetry and achievable with averaging.

258 11 Discussion and Next Steps

259 Chronoscalar unification is now complete at the conceptual level. Major implications:

- 260 1. **A single scalar field replaces all fundamental interactions.** Geometry,
261 electromagnetism, weak interactions, and gravity are all Hessian projections of T .
- 262 2. **Mass is environmental.** Inertial mass arises from $|\nabla T|$ dressing; EW scale
263 from transverse curvature.

- 264 3. **Higgs is not a field.** It is the radial excitation of the chronoscalar condensate.
- 265 4. **Gauge forces are geometric.** $SU(2)\times U(1)$ is the symmetry group of the transverse
266 manifold.
- 267 5. **Quantum nonlocality is classical geometry.** Gabriel Corridors allow $v_{\text{corr}} \gg c$
268 without paradox.
- 269 6. **Dark matter and dark energy are unnecessary.** Both emerge from chronoscalar
270 compression and vacuum cancellation.
- 271 7. **The next step is unifying QCD.** Paper XIX will address whether color arises as a
272 curvature defect in the T -manifold analogous to electroweak symmetry.

273 12 Conclusion

274 Chronoscalar Field Theory has reached full unification:

275 - Gravity = transverse tensor modes of T - Electromagnetism = transverse vector modes
276 of T - Weak force = curvature of transverse manifold - Higgs = radial mode of T - Mass
277 = environmental chronoscalar dressing - Causality = alignment with ∇T - Entanglement =
278 propagation along chronoscalar null corridors - Baryogenesis and leptogenesis = CPT violation
279 from primordial ∇T - Vacuum energy cancellation = exact balance of gradient and matter terms

280 All of physics emerges from one field, one displacement, one gradient.

281 This paper completes the electroweak unification sector of CFT and prepares the ground for
282 Paper XIX: *Chronoscalar QCD and Color as a Topological Defect of the T-Manifold*.

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