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Title:	Grand pleromal transmutation: UV condensates via Konishi anomaly, dimensional transmutation and ultraminimal GUTs
Authors:	Aulakh, C.S. (/jspui/browse?type=author&value=Aulakh%2C+C.S.)
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Abstract:	<p>Using consistency requirements relating chiral condensates imposed by the so called Generalized Konishi Anomaly, we show that dimensional transmutation via gaugino condensation in the ultraviolet drives gauge symmetry breaking in a large class of asymptotically strong Super Yang Mills Higgs theories. For Adjoint multiplet type chiral superfields Φ (transforming as $r \times r^-$ representations of a non Abelian gauge group G), solution of the Generalized Konishi Anomaly (GKA) equations allows calculation of quantum corrected VEVs in terms of the dimensional transmutation scale $\Lambda_{UV} \approx M_X e^{[Formula presented]}$ which determines the gaugino condensate. Thus the gauge coupling at the perturbative unification scale M_X generates GUT symmetry breaking VEVs by non-perturbative dimensional transmutation. This obviates the need for large (or any) input mass scales in the superpotential. Rank reduction can be achieved by including pairs of chiral superfields transforming as either $(Q(r), Q^-(r^-))$ or $(\Sigma((r \otimes r) \text{symm})), \Sigma^-(r^- \otimes r^- \text{symm})$, that form trilinear matrix gauge invariants $Q^+ \cdot \Phi \cdot Q, \Sigma^+ \cdot \Phi \cdot \Sigma$ with Φ. Novel, robust and ultraminimal Grand unification algorithms emerge from the analysis. We sketch the structure of a realistic Spin(10) model, with the 16-plet of Spin(10) as the base representation r, which mimics the realistic Minimal Supersymmetric GUT but contains even fewer free parameters. We argue that our results point to a large extension of the dominant and normative paradigms of Asymptotic Freedom/IR colour confinement and potential driven spontaneous symmetry breaking that have long ruled gauge theories.</p>
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