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Higgs-free symmetry breaking mechanism from the complex dynamics of Levy flows ERVIN GOLDFAIN, OptiSolve Consulting — Using the statistical model of Levy flows, we derive the following Higgs-free formula for gauge boson masses:

$$m_{W(Z)} = \frac{G_F^{-1/4}}{2\sqrt{2\pi}} \sqrt{\frac{\gamma \Gamma_{W,(Z)}}{\alpha_{self,W(Z)}}}$$

where γ denotes the damping parameter associated with the dynamics of the flow, G_F is the Fermi constant and $\Gamma_{W(Z)}$ represents the decay width of the $W(Z)$ boson, respectively. The self-interaction strength $\alpha_{self,W(Z)}$ takes on two possible values, $\alpha_{self} = \alpha_2$ for $Z^0$and $\alpha_{self} = \alpha_2 + \alpha_{EM}$ for W^+, W^-. Here, α_2 is the weak isospin strength and α_{EM} is the fine structure constant. From this formula, we predict

$$m_{W^\pm} = 78.4GeV, \quad m_{Z^0} = 91.7GeV$$

These values are in good agreement with experimental data ($m_W^{\exp} = 80.46GeV$,$m_Z^{\exp} = 91.19GeV$).

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