p-Adic mass calculations

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1. were inspired by the observation that weak, hadronic, and electron's Compton scale might correspond to certain Mersenne primes and led to a model for particle masses relying on p-adic thermodynamics withenergy replaced with conformal weight defined as eigenvalue of conformal scaling generator L_0.

2. assume that

   (a) mass squared of particle is thermal expectation value in p-adic thermodynamics and that the p-adic valued mass squared is mapped to real mass squared by canonical identification

   (b) (super)conformal invariance implying that the partition function determining the p-adic valued mass squared of particle as thermal expectation value is highly unique since the padic existence for the Boltzmann weights fixes p-adic temperature to be inverse integer: $T = 1/n$ and requires integer valued spectrum of conformal weights guaranteed by superconformal invariance

   (c) p-adic length scale hypothesis

3. predict that fermion masses depend only on p-adic temperature, which for fermions is maximal and equals to $T = 1$ and s on p-adic prime p through p-adic mass scale proportional to $m(CP_2)1/\sqrt{p}$, where $m(CP_2)$ is CP_2 mass fixed by CP_2 "radius".

4. have problems with gauge boson masses solved by including a contri- tion from string tension of string like object assignable to any particle: for gauge bosons this contribution dominates since p-adic temperature is $T = 1/2$ or smaller. This suggest an extension of conformal symmetry and a further generalization to Yangian symmetry.