LHC Higgs: 145 GeV or 126 GeV ?

by Frank Dodd (Tony) Smith Jr.

Abstract:

CERN's analysis of 5/fb of data collected by the LHC by Halloween 2011

led to announcement on 13 Dec 2011 of CERN's Consensus View:

Exclusion of Standard Model Higgs with 3 Mass States at 145, 180, and 240 GeV

and

Observation of Excesses compatible with 1 SuperString Higgs Mass State at 126 GeV.

Despite a CERN Consensus View Against a SM Higgs with those 3 Mass States

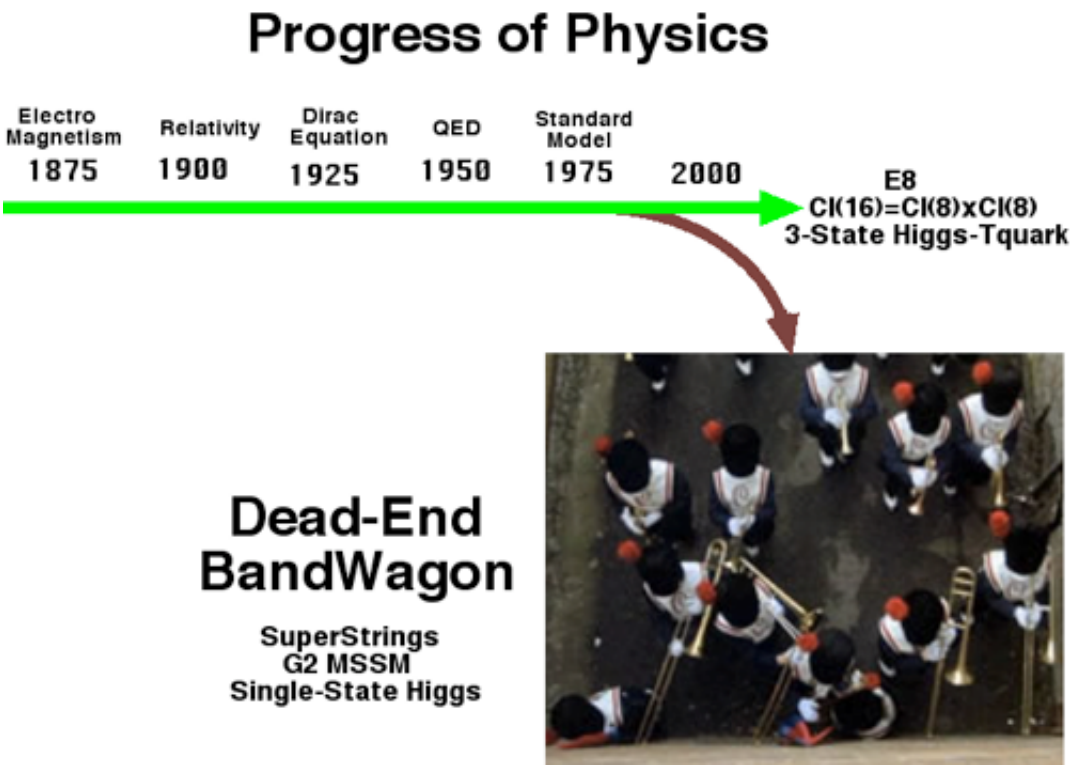
I remain in favor of a Standard Model Higgs with 3 Mass States including 145 GeV.

(References are included in the body of the paper and in linked material.)

LHC Higgs: 145 GeV or 126 GeV ?

Frank Dodd (Tony) Smith, Jr. - 2011 - viXra 1112.0035

145 GeV Standard Model Higgs State leads to E8 Physics with 3-State Higgs-Tquark System
with other SM Higgs States at 180 GeV and 240 GeV (viXra 1108.0027).



126 GeV Standard Model Higgs State leads to the SuperString Theory Dead-End BandWagon,
including a G2 MSSM Model of Kane et al (arXiv 1112.1059).
(image from Animal House)

Based on 5/fb of data collected by the LHC through Halloween 2011,
announced at a 13 Dec 2011 public seminar,
CERN declared:

Exclusion: ~~SM Higgs States at 145, 180, and 240 GeV~~

Observation: SM Higgs State Excess Events around 126 GeV

Here is what CERN said, along with some of my objections to CERN's Consensus View:

CMS (Guido Tonelli) summary: "... The SM Higgs boson ...
Constraints from EWK precision measurements favour a light Higgs with Standard Model like couplings ...
We have established new 95% CL exclusion limits: 127 GeV - 600 GeV ...
we observe in our data a modest excess of events between 115 and 127 GeV that appears, quite consistenly, in five independent channels.
The excess is most compatible with a SM Higgs hypothesis in the vicinity of 124 GeV and below, but the statistical significance ... is not large enough to say anything conclusive. ...".

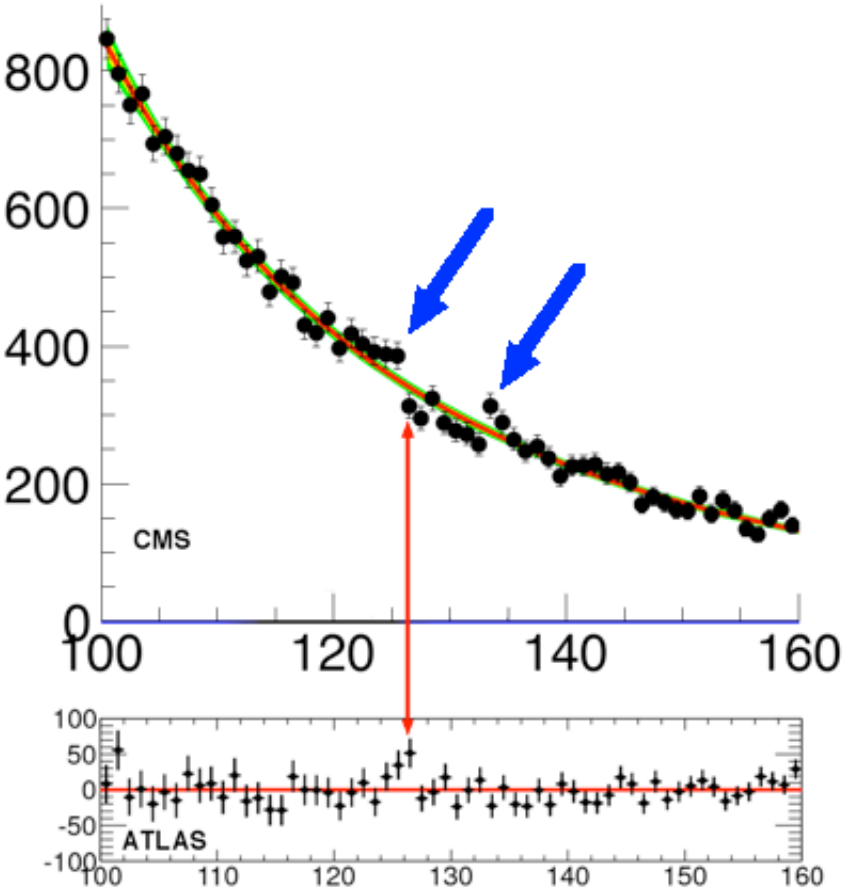
Here I would like to make a personal comment to commend Guido Tonelli for showing a slide commemorating the passing of his father Giuliano Tonelli on 11 Dec 2011. The photo of his father shows a happy man with a good soul, which is far more important than any technicalities of high energy physics. I am grateful to have been privileged to see that tribute slide.

ATLAS (Fabiola Gianotti) summary: "... Standard Model Higgs searches ...
We have restricted the most likely mass region (95% CL) to 115.5 - 131 GeV ...
We observe an excess of events around mH ~ 126 GeV ...".

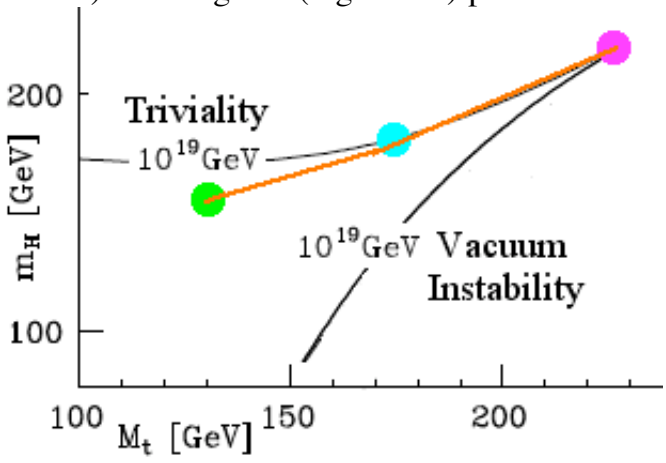
Is the CERN Consensus View Against the 3-State Higgs (145, 180 GeV, and 240 GeV) Justified ?

1- The SM Higgs Excess Events around 126 GeV are based on the gamma-gamma channel for both CMS and ATLAS and on the Higgs to ZZ to 4l channel for ATLAS:

The two apparent peaks (blue arrows) in the CMS gamma-gamma histogram

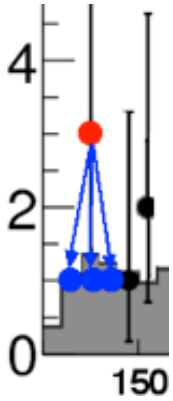


are in the same region in which CDF saw a controversial Wjj bump.
They could be interpreted as:
T0 meson (Tquark and Up antiquark) with low-mass-state Tquark
and
T0c meson (Tquark and Charm antiquark) with low-mass-state Tquark
with the Tquark lifetime being extended due to its being involved in
the meson state (somewhat like a heavy version of the neutral spin-0 pion).
A low-mass-state Tquark mass on the order of 130 GeV is roughly consistent
with the two CMS diphoton peaks. The 3 states of the Higgs-Tquark system are
described below in some detail, but roughly they are located at the
green (low mass) and cyan (mid mass) and magenta (high mass) points:



Further,
the highest point of the ATLAS bump at 126 GeV did not coincide with a high point in the CMS bump but rather to a low point, so
if you were to combine the ATLAS and CMS data points, it would seem that there would be significant cancellation
causing a simple SM Higgs interpretation based on ATLAS gamma-gamma data to go away.

As to the ATLAS claim of a 3-event bump at 125 GeV in the Higgs to ZZ to 4l channel,

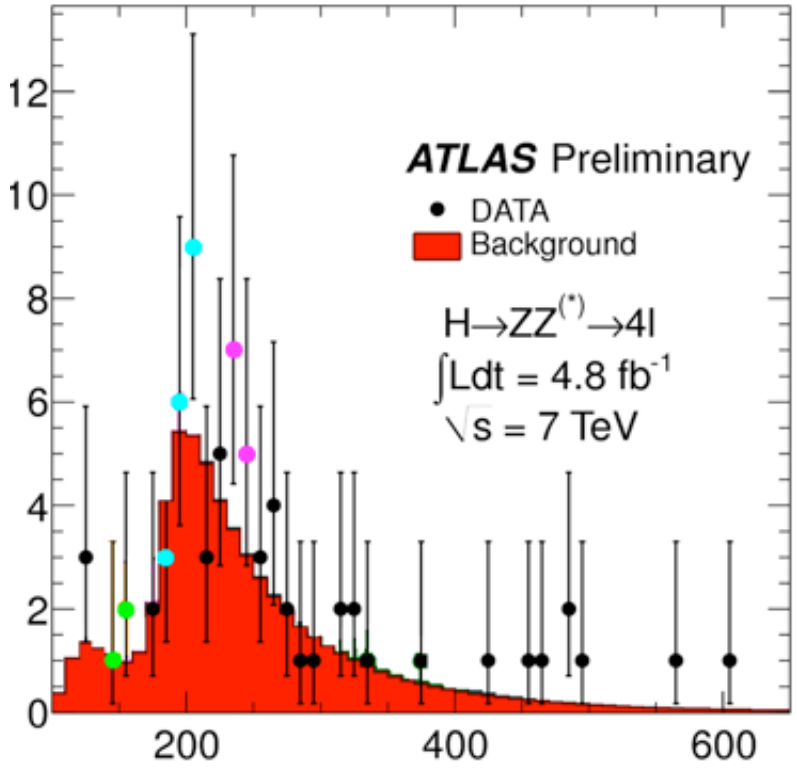


note that the two adjacent bins are empty and that if those 3 events were spread evenly among the 3 bins the result would be consistent with the expected background and the ATLAS support from that channel for a 125 GeV simple SM Higgs would go away.

2 - The exclusion of the intermediate range from 141 to 470 GeV by the CERN Consensus View is not justified.

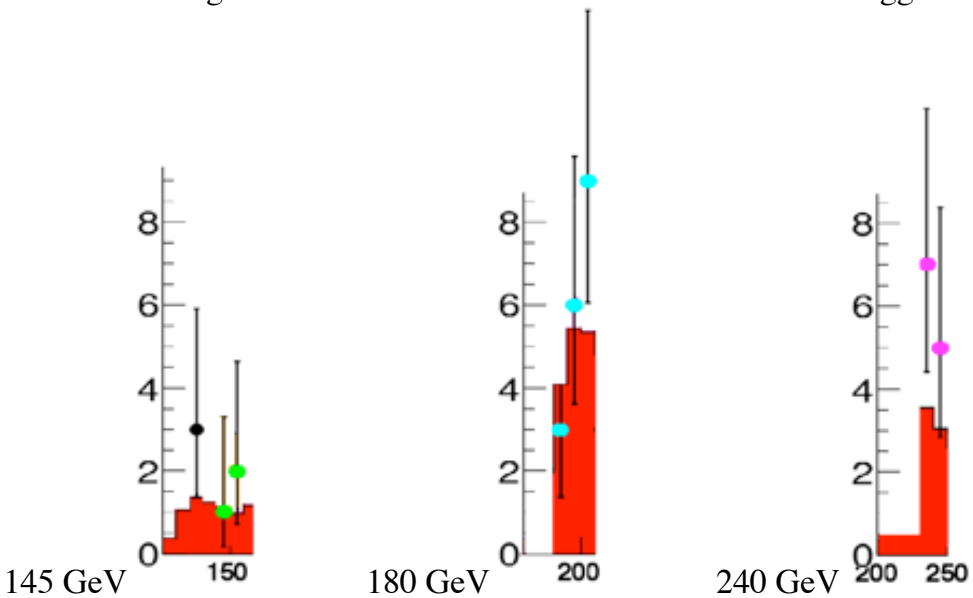
The CERN Consensus View Exclusion of SM Higgs at 145, 180, and 240 GeV is at 95% confidence level. Tommaso Dorigo said 2 Dec 2011 on his blog "... a upper limit at 95% confidence level is not enough to assert that the particle does not exist: the particle is then only "disfavoured", because only once in twenty cases would the experiment find that result if the particle did have that mass and existed and behaved as the Standard Model predicts. ... in order to really prove that our understanding of electroweak symmetry breaking is flawed and that there is no Higgs boson we would need a much, much more solid evidence than a mere "95% exclusion". ...". The weakness of a 95% confidence level has been described by XKCD.

Further, in the Higgs to ZZ to 4l channel ATLAS saw (according to ATLAS-CONF-2011-162.pdf) 71 events



where the green, cyan, and magenta dots correspond to Standard Model Higgs with 3 Mass States

at 145 GeV and 180 GeV and 240 GeV that
leads to a unified E8 Physics Model of Gravity plus Standard Model (viXra 1108.0027).
It seems clear to me that the histogram shows evidence for the existence of SM Higgs at

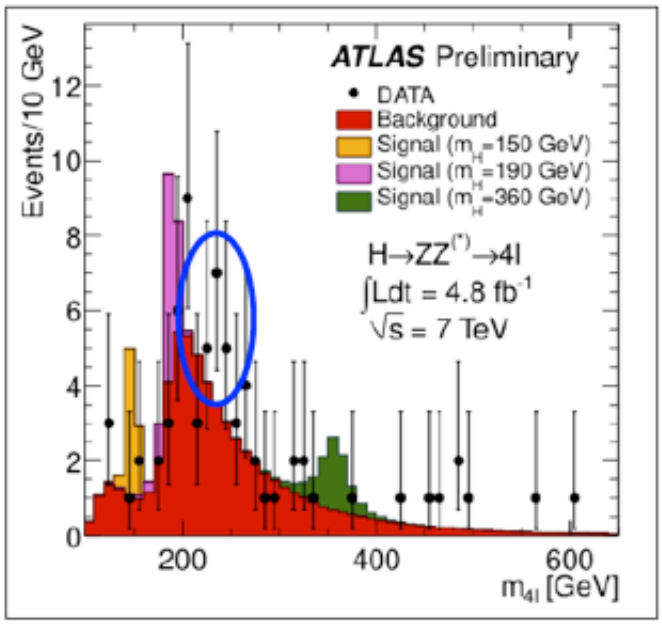


The ATLAS histogram presented by Fabiola Gianotti on 13 Dec 2011 had the same 71 events as ATLAS-CONF-2011-162.pdf .

Why does the CERN Consensus View not recognize the evidence for SM Higgs at 145, 180, and 240 GeV ?

For one thing,
CERN's analytical techniques may include things like the Look Elsewhere Effect (LEE) that can flatten bumps.
In my view,
it is improper to use LEE with respect to evaluation of models such as E8 Physics that predict in advance the location of bumps,
such as the E8 Physics bumps predicted in advance of the LHC data to be around 145, 180, and 240 GeV.
ATLAS-CONF-2011-162.pdf said "... The p0-value is the probability of upward fluctuations in the background as high as or higher than the
excesses observed in data. ... deviations from the background-only hypothesis are observed for ... mH = 244 GeV with a local p0-value of 1.1% (2.3 sigma) ... These values do not account for the so-called look-elsewhere effect ...[LEE]... once the look-elsewhere effect is considered ... the observed local excess... for ... mH = 244 GeV ... is ... not ... significant ...". I consider that use of LEE by ATLAS to be improper.

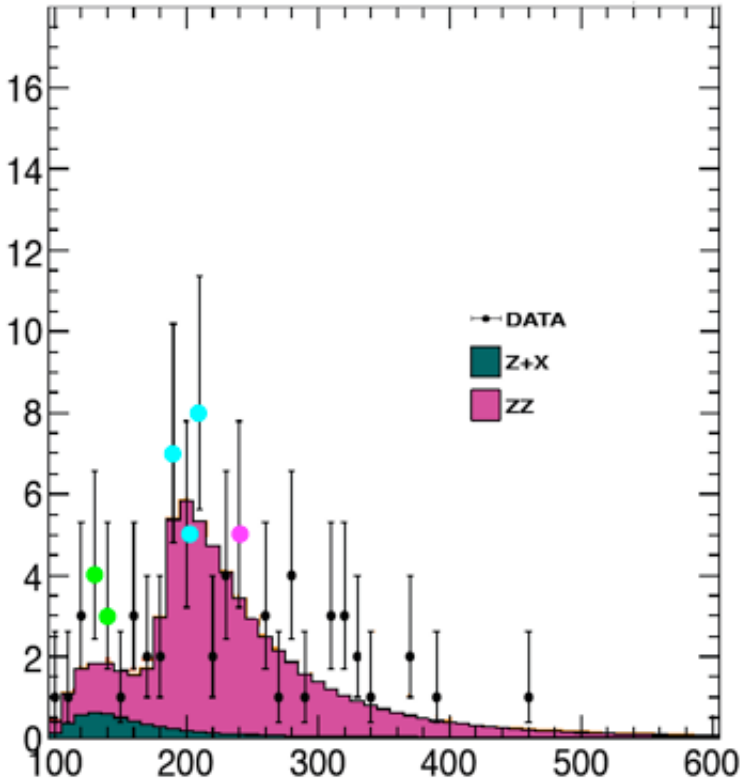
For another thing,
in E8 Physics the Higgs has the conventional Standard Model Cross Section,
but that Cross Section is shared among the 3 Mass States around 145, 180, and 240 GeV
so that each of the 3 States has a smaller Cross Section than would be expected for a Single-Mass-State SM Higgs.
That is exactly what was shown around 240 GeV on a 13 Dec 2011 Spare Slide of Fabiola Gianotti for ATLAS



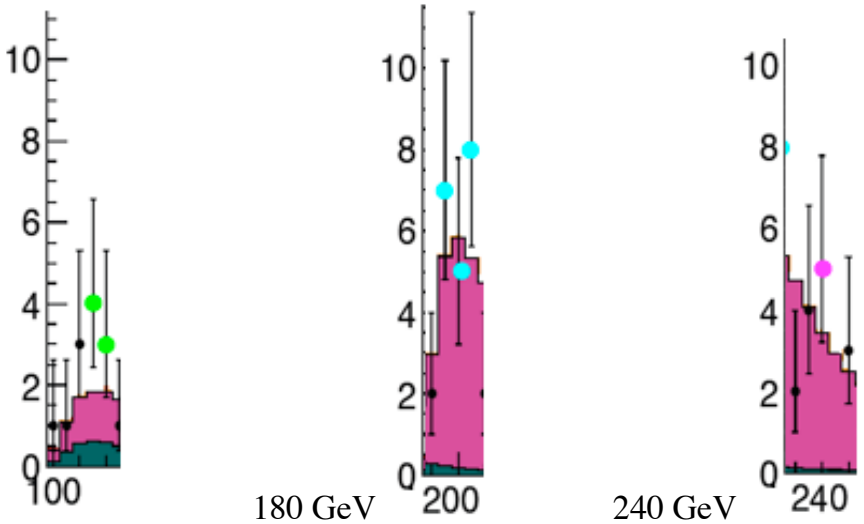
In the region 212-255.5 GeV, containing ~ 90% of the signal for m_H=244 GeV, 22 events are observed in the data, with a background expectation of 16 events. The signal expectation is 11 events.

that is consistent with 240 GeV or so being one of 3 Mass States of the Standard Model Higgs for which the Cross Section would be less than that expected for a Single-Mass-State Standard Model Higgs

In the Higgs to ZZ to 4l channel CMS saw (according to HIG-11-025-pas.pdf) 72 events



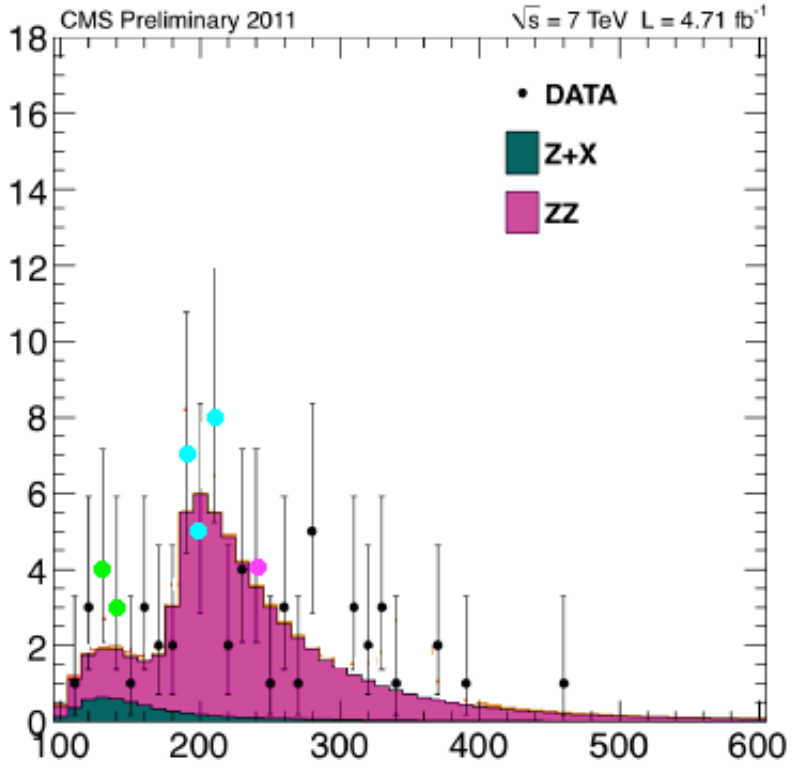
distributed consistently with the Standard Model Higgs with 3 Mass States
that leads to a unified E8 Physics Model of Gravity plus Standard Model (viXra 1108.0027).
It seems clear to me that the histogram shows evidence for the existence of SM Higgs at



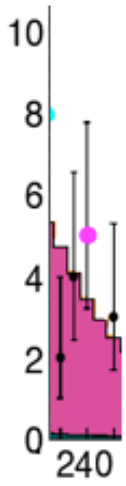
It seems to me that the 145 GeV excess is a bit clearer in the CMS data,
the 240 GeV excess is a bit clearer in the ATLAS data, and the 180 GeV excess is pretty clear in both data sets.

The CMS histogram presented by Guido Tonelli on 13 Dec 2011 had 72 events but they do not appear to be

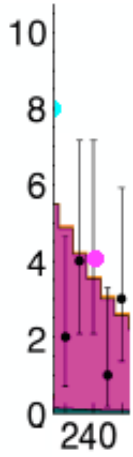
exactly the same as the 72 events of HIG-11-025-pas.pdf



For example,

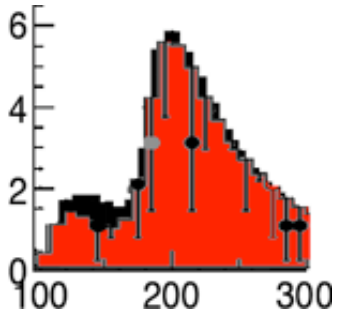


the 240 GeV bin of HIG-11-025-pas.pdf has 5 events, but the same bin of Guido Tonelli



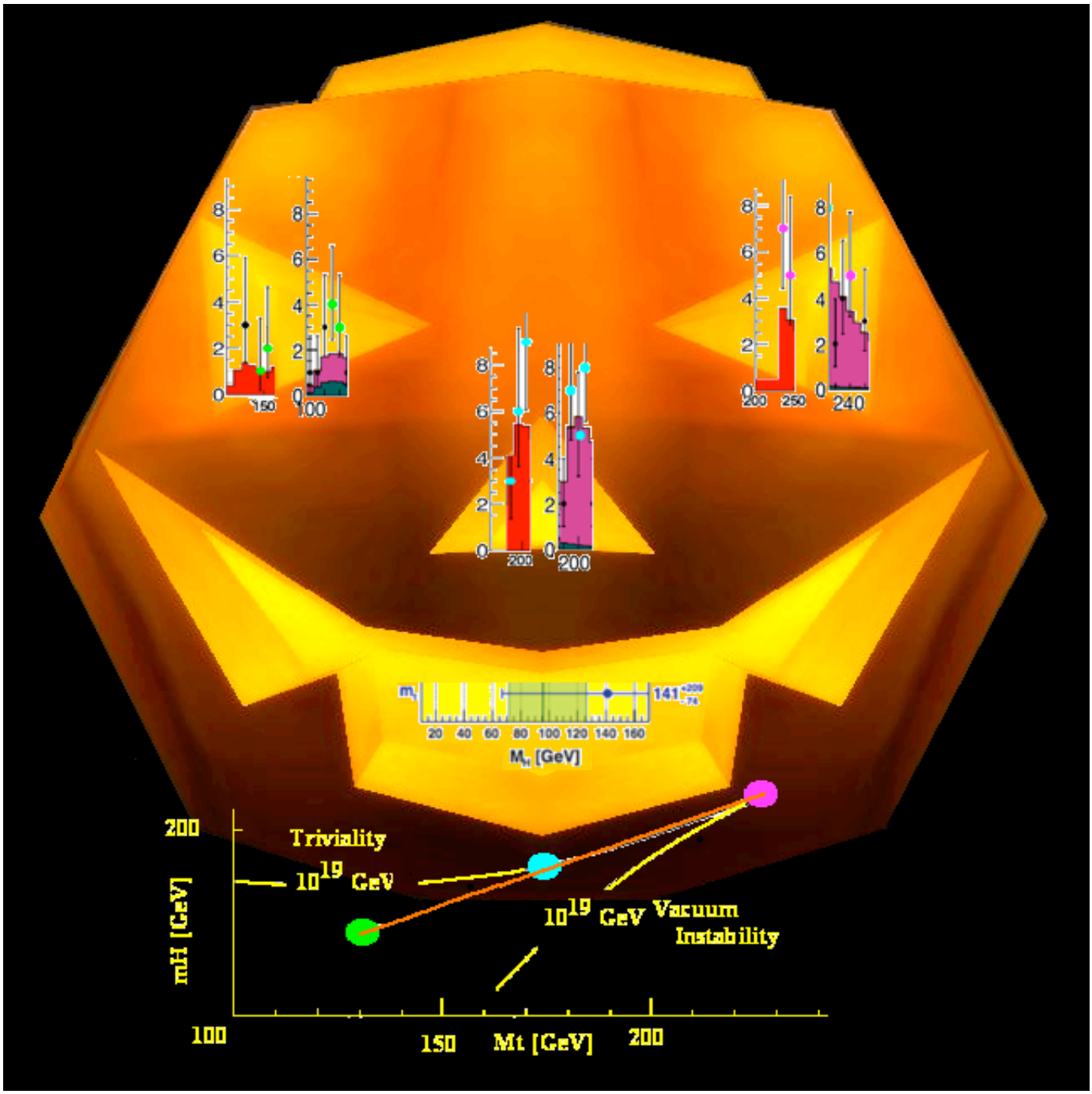
has 4 events,
perhaps caused by moving one of the 5 events to the next higher bin which then goes from empty to 1 event.
The result is that the Guido Tonelli plot does not show a very clear excess at 240 GeV.

The 240 GeV bump over background is not as pronounced in the CMS data as in the ATLAS data
so it is interesting to compare backgrounds of the two experiments. If the graphs are scaled comparably
and the CMS background is shown as black and the ATLAS background is shown as red,



then it is clear that the CMS background is somewhat higher,
particularly in the ranges from 180 GeV to 240 GeV and from 125 GeV to 160 GeV.

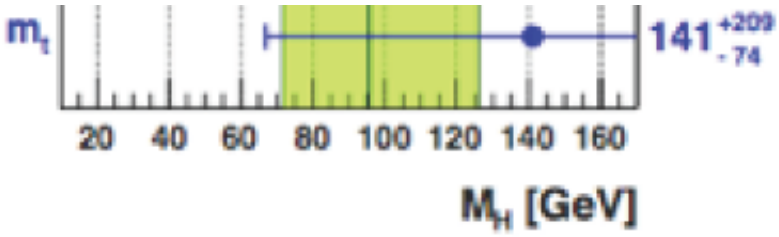
In light of the above, to the question
"Is the CERN Consensus View Against the 3-State Higgs (145, 180, and 240 GeV) Justified ?"
my answer is
NO.



The Great Pumpkin of the Halloween 2011 Data shows the True State of Physics.

Using the ideas of - African IFA Divination; Clifford Algebra Cl(8)xCl(8) = Cl(16); Lie Algebra E8 ;
Hua Geometry of Bounded Complex Domains; Mayer Geometric Higgs Mechanism;
Batakis 8-dim Kaluza-Klein structure of hep-ph/0311165 by Hashimoto et al;
Segal Conformal Gravity version of the MacDowell-Mansouri Mechanism;
Real Clifford Algebra generalized Hyperfinite II1 von Neumannn factor AQFT; and
Joy Christian EPR Geometry - my E8 Physics model has been developed with a 3-state Higgs system in which the Higgs is related to the Primitive Idempotents of the real Clifford Algebra Cl(8).

The Pumpkin Mouth Plot shows that the Electroweak Gfitter best fit



for a floating Tquark mass as is required in my 3-State Higgs-Tquark System in which Higgs and Tquark masses run
is for a Higgs state with central value of 141 GeV and upper bound 141+209 = 350 GeV.

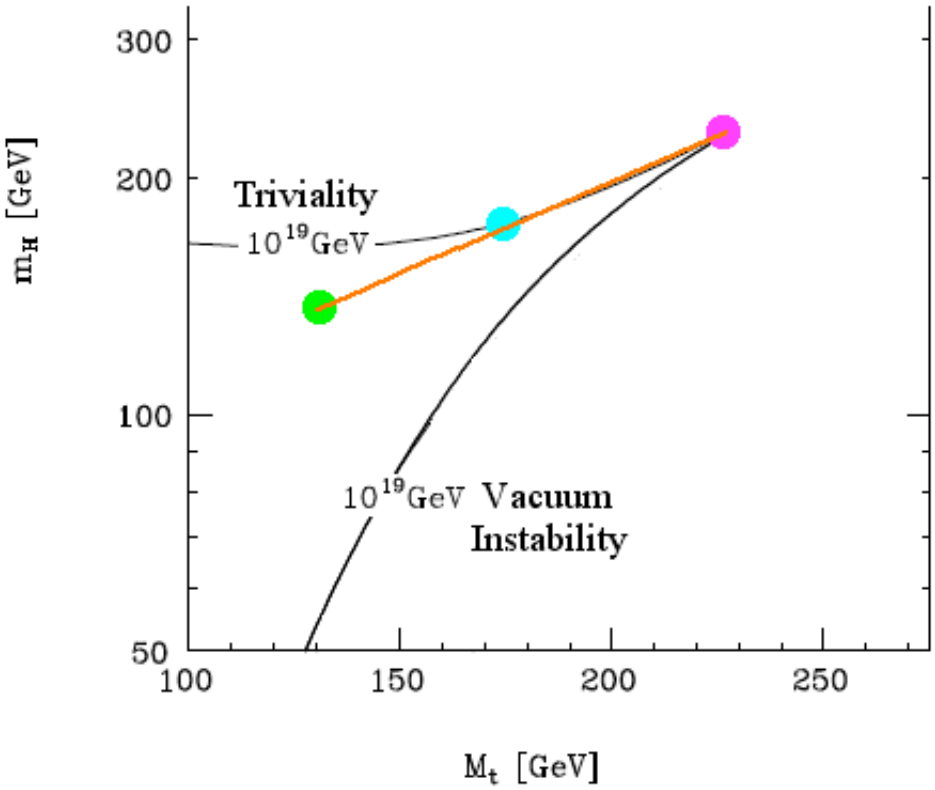
The Pumpkin Eye-Nose-Eye Plots are for data (about 5/fb) taken by Halloween 2011:

Green Eye: ATLAS-CMS ZZ-4l plots of Halloween 2011 excesses seen in 110-160 GeV Higgs range;

Cyan Nose: ATLAS-CMS ZZ-4l plots of Halloween 2011 excesses seen in 160-210 GeV Higgs range;

Magenta Eye: ATLAS-CMS ZZ-4l plots of Halloween 2011 excesses seen in 210-260 GeV Higgs range.

According to hep-ph/0307138 by C. D. Froggatt:
"... the top quark mass is the dominant term in the SM fermion mass matrix ... [so]... it is likely that its value will be understood dynamically ... the self-consistency of the pure SM up to some physical cut-off scale Λ imposes constraints on both the top quark and Higgs boson masses.
The first constraint is the so-called triviality bound: the running Higgs coupling constant lambda(mu) should not develop an Landau pole for mu < Λ .
The second is the vacuum stability bound: the running Higgs coupling constant lambda(mu) should not become negative leading to the instability of the usual SM vacuum.
These bounds are illustrated in Fig. 3 ... we shall be interested in the large cut-off scales Λ = 10^19 GeV, corresponding to the Planck scale [I have edited this sentence to restrict coverage to a Planck scale SM cut-off and have edited Fig. 3 and added material relevant to my E8 Physics model with 3 Higgs-Tquark states] ...
The upper part of each curve corresponds to the triviality bound.
The lower part of each curve coincides with the vacuum stability bound and
the point in the top right-hand corner, where it meets the triviality bound curve, is the quasi-fixed infra-red fixed point for that value of Λ . ...



... Fig. 3: SM bounds in the (Mt , MH) plane ...".

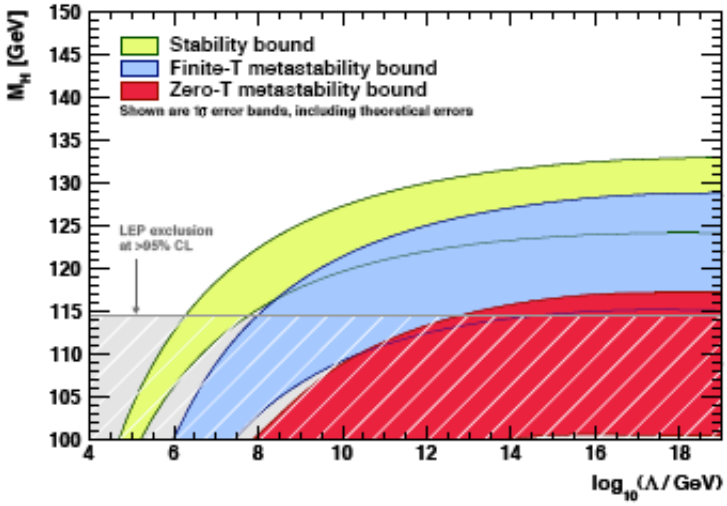
The Magenta Dot ● is the high-mass state of a 220 GeV Truth Quark and a 240 GeV Higgs.
It is at the critical point of the Higgs-Tquark System with respect to Vacuum Instability and Triviality.
It corresponds to the description in hep-ph/9603293 by Koichi Yamawaki of the Bardeen-Hill-Lindner model
That high-mass Higgs is in the 210-260 GeV range of the Higgs Vacuum Instability Boundary
which range includes the Higgs VEV.

The Gold Line leading down from the Critical Point roughly along the Triviality Boundary line is based on Renormalization Group calculations with the result that MH / MT = 1.1 as described by Koichi Yamawaki in hep-ph/9603293 .

The Cyan Dot ● where the Gold Line leaves the Triviality Boundary to go into our Ordinary Phase is the middle-mass state of a 174 GeV Truth Quark and a 180 GeV Higgs. It corresponds to the Higgs mass calculated by Hashimoto, Tanabashi, and Yamawaki in hep-ph/0311165 where they show that for 8-dimensional Kaluza-Klein spacetime with
the Higgs as a Truth Quark condensate 172 < MT < 175 GeV and 178 < MH < 188 GeV.
That mid-mass Higgs is in the 160-210 GeV range of the Higgs Triviality Boundary. The physical meaning of the Triviality Bound is described by Pierre Ramond in his book Journeys Beyond the Standard Model (Perseus Books 1999) where he says at pages 175-176:
"... for a ... (large) Higgs mass, we expect the standard model to enter a strong coupling regime ... losing ... our ability to calculate ... it is natural to think ... that the Higgs actually is a composite ... The resulting bound ... is sometimes called the triviality bound. The reason for this unfortunate name (the theory is anything but

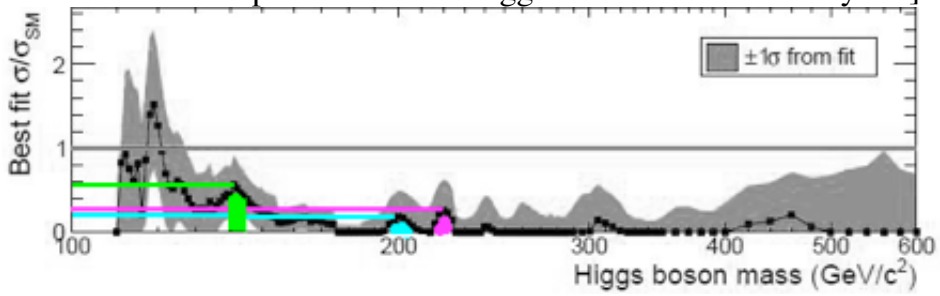
trivial) stems from lattice studies where the coupling is assumed to be finite everywhere; in that case the coupling is driven to zero, yielding in fact a trivial theory. In the standard model ... the coupling ... is certainly not zero. ...".

The Green Dot where the Gold Line terminates in our Ordinary Phase is the low-mass state of a 130 GeV Truth Quark and a 145 GeV Higgs. Its location is determined by E8 Physics calculation of the basic Truth Quark Mass. The 145 GeV Higgs also comes from such calculations, and is the Higgs state that is necessary for agreement with arXiv 0960.0954 by Ellis, Espinosa, Giudice, Hoecker and Riotto who require a Higgs with 135 < MH < 158 GeV, saying:
"... the Standard Model may survive all the way to the Planck scale for an intermediate range of Higgs masses ... We evaluate ... on the basis of a global fit to the Standard Model made using the Gfitter package ... a global fit to electroweak precision data within the SM ...
favors MH < 158 GeV ... Lower bounds on the Higgs mass due to absolute vacuum stability .. and finite-temperature ... and zero-temperature metastability ... includ[ing] theoretical uncertainties ...



...["allow (as Tommaso Dorigo said in an entry of 23 July 2009 on his blog) the SM to be valid for all energies up to the Planck scale (set at 2 x 10^18 GeV) only if the Higgs boson has a mass above 135 GeV or so"]...".

Tommaso Dorigo in his 22 Aug 2011 blog post "New CMS Limits on Higgs Mass" said:
"... CMS ... combined all their results [not just H -> GammaGamma and the Golden Channel] ...
... the "best fit" of the signal rate provided by the data, as a function of mass ...[I have added color coding and some lines for peaks for the 3 Higgs mass states of E8 Physics]...



... the fluctuation at 140 GeV is less than half as strong as it would be expected to be,
if a 140 GeV Higgs existed. ...".
The Best-fit plot seems to me to say about my E8 Physics 3-state Higgs model:
There are 3 peaks that are located roughly where my 3-state Higgs model has its 3 mass states
(therefore look-elsewhere effect corrections should not be applied)
and the 3 peak heights are:

low-mass peak is 55 per cent of what a SM Higgs should be;

mid-mass peak is 20 per cent of what a SM Higgs should be;

high-mass peak is 25 per cent of what a SM Higgs should be.

If you add the strengths of the 3 peaks you get 55 + 20 + 25 = 100 per cent
therefore
since my 3-state Higgs model splits the single SM Higgs into 3 states,
the CMS Best-fit plot supports my 3-state Higgs model.

Future LHC Exploration:

My view is that my 3-state Higgs E8 Physics model, in which the Standard Model remains valid up to the Planck scale,
is realistic and that a useful program of future LHC exploration might be:

The LHC can explore the energy region above electroweak symmetry breaking (order of 1 TeV).
In that region, assuming only the Standard Model plus Gravity as described by E8 Physics,
the Higgs mechanism will not be around to generate mass, so everything will be massless, and:

1 – The T and B quarks may not be so different, and the Kobayashi-Maskawa matrix may look very different,
with possible consequences for CP violation.

2 – Massive neutrinos may lose their mass,
so neutrino oscillation phenomena may change in interesting ways.

3 – With no massive stuff, Conformal Symmetry may become important,
leading to phenomena such as:

a – Twistor stuff may be directly observable. See for example the book Mathematics and Physics by Manin, who says there:
"… What binds us to space-time is our rest mass, which prevents us from flying at the speed of light, when time stops and space loses meaning. In a [massless] world … there are neither points nor moments of time; beings … would live nowhere and nowhen; only poetry and mathematics [and the LHC] are capable of speaking meaningfully about such things. One point of CP3 is the whole life history of a free …[massless particle]… the smallest event that can happen to …[it]…".

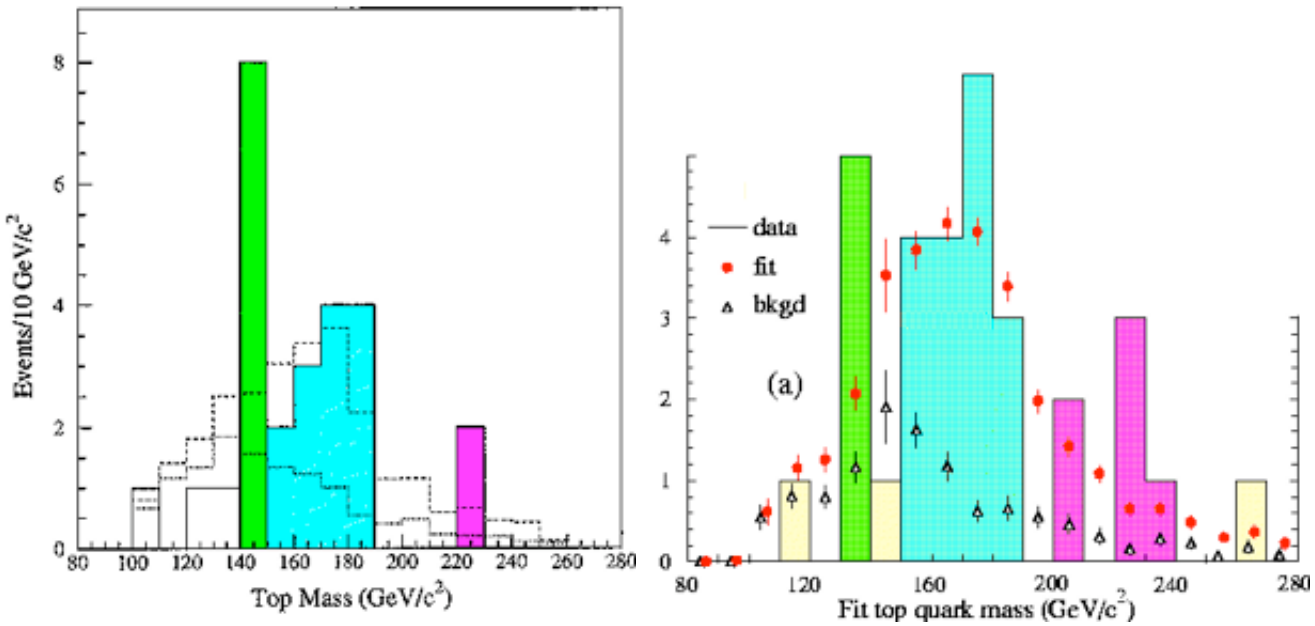
b – Segal conformal cosmological stuff (maybe Dark Energy) may be observable;

c – Since the Conformal group acts in 6-dim spacetime that could be denoted by C6,
maybe two new large physical spacetime dimensions might emerge,
with 4+4 = 8-dim M4 x CP2 Kaluza-Klein becoming 6+4 = 10-dim C6 x CP2 Kaluza-Klein
perhaps leading to a connection emerging between non-supersymmetric Bosonic String Theory
whose Lattice Affinization has Monster Group symmetry
and
a Bohm-type Quantum Theory based on interpreting Strings as World-Lines
(see tony5m17h.net/MonsterStringCell.pdf and tony5m17h.net/QM03.pdf).

References:

my web site - its mirror site
vixra 1108.0027 also pdf - Introduction to E8 Physics
Shpongle
Moriond 2012 - vixra 1112.0072

I am not happy
with the Unjustified CERN Consensus View Against the 3-State Higgs (145, 180 GeV, and 240 GeV).
It reminds me of my past experience with Fermilab's similar Bias against the 3-State Truth Quark.
Back in the 1990s Fermilab CDF saw (left image below) 3 peaks for the Truth Quark Mass.
but they ignored the high mass (magenta) peak and dismissed the low mass (green) peak as a "statistical fluctuation",
and insisted that the medium mass (cyan) peak was the Single Mass State of the Truth Quark.



Even when the independent Fermilab detector D0 (right image above) saw the same 3 peaks
including a similar tall low mass (green) peak
(very unlikely that an independent detector would produce a similar "statistical fluctuation" in the same

place)
Fermilab continued to ignore the low mass (green) and high mass (magenta) peaks and to insist that the Truth Quark had only a Single Mass State, at the middle mass (cyan) peak.
For the better part of two decades, up to the present, Fermilab designed experiments and analysis based on their Single Mass State model of the Truth Quark.
Detailed study of their results continued to point to the Truth Quark having 3 Mass States
so I consistently pointed out the consistency of Fermilab's own experiments with the 3 Mass State model,
but my reward has been to be ingnored, ostracized and blacklisted.

My health (lupus, kidney failure, and heart attack) is not good enough
for me to continue fight against UnJustified Bias of the SocioPolitical Consensus of the Physics Community.

Since my Physics ideas are fundamentally intertwined with my Fundamental Belief System back through Ramon Llull, to Jesus, to Confucius and Lao Tze and the I Ching and Futomani Divination and the Rig Veda, and
to their African source of IFA
attacks (ostracism, blacklisting, etc) on my Physics ideas hurt me on a very deep personal level.

If today's USA were a happy land of opportunity for constructive prosperity,
I could say GoodBye to Physics
and devote my energies to other areas,
perhaps in my profession of law.
However, the practice of law in today's USA has become a blind pursuit of dollar profit
and
the only profitable "acceptable occupations" in today's USA are:

the Big Bank Derivative Casino Ponzi Scheme funded by Quantitative Easing money-printing
and
government/banking controlled bureaucracies (education, corrections, health care, regulatory boards)
in which success depends on giving up Independent Thought and becoming Conformist to the Consensus
and
the Military Industry whose life-blood is destroying property and killing people who are too weak to fight back.

If I were to go into any of those, I would lose my self-respect
to the extent that I could not live with myself.

Confucius had good advice (Analects VIII 13) for people in my situation:

When a country is ill-governed, it is a disgrace to be rich and honored.
Do not stay in such a State.

If I were to follow the advice of Confucius,
I would leave the ill-governed USA and move to a country
whose economy is based on productive work instead of Ponzi Casinos and stagnant bureaucracies

and
whose foreign policy is based on economic investment instead of death and destruction.

China seems to be such a country.
If I had youth and good health I would move there,
but my health and age are what they are
so
it seems to me that all that is left for me in this life is
to leave my thoughts on the web for anyone who cares to consider them.

To the few (you know who you are) who helped me with my efforts in life,
I owe whatever success I have had to you, so I give you ... THANKS.

To the many (you also know who you are) who made my road of life rougher than it would otherwise have been, due to your pitiful minds and pitfully small hearts, I give you what you deserve ... PITY.