



## Outline:

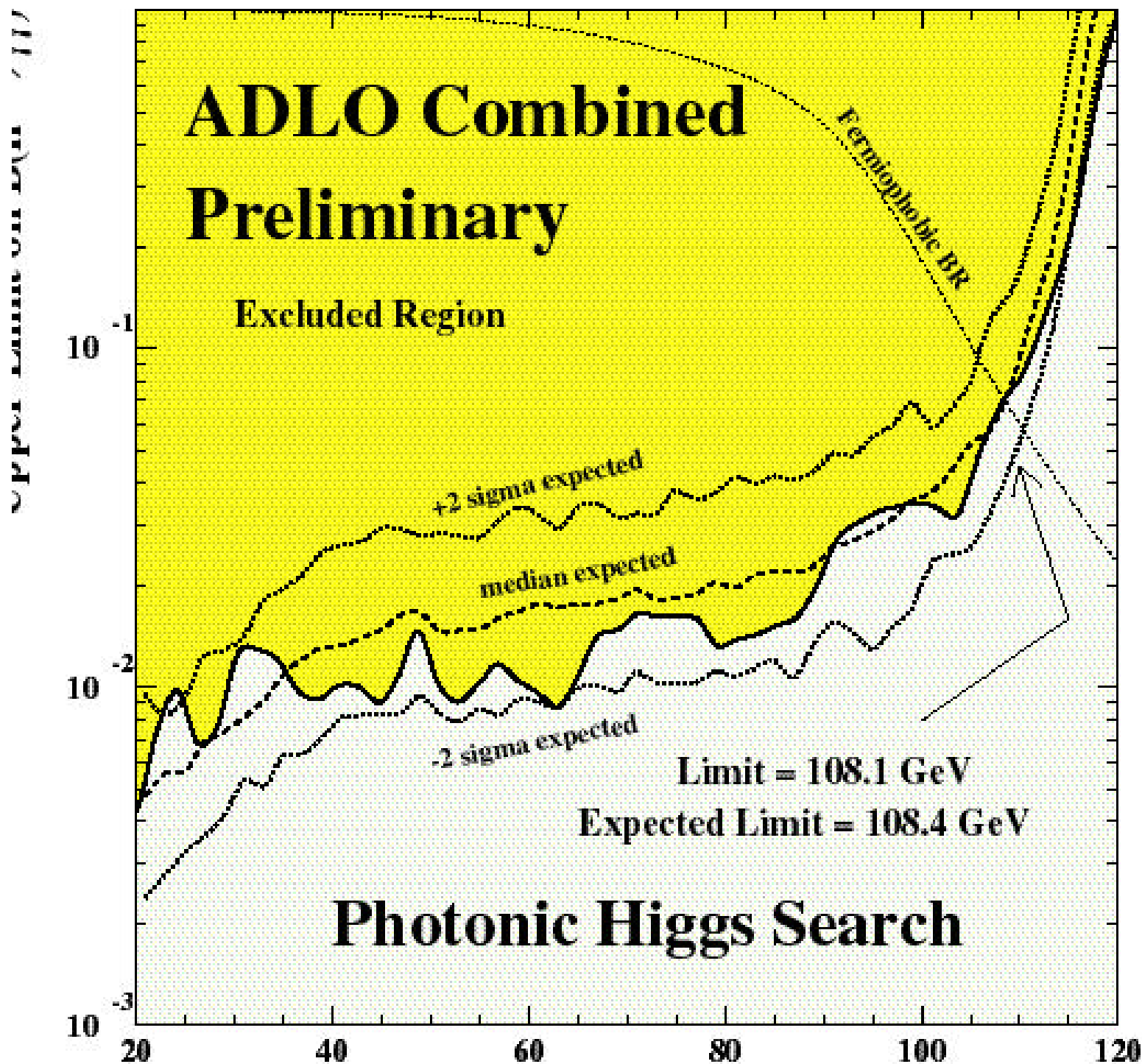
- Review the individual photonic analyses
  - summary of candidates, individual limits
  - features of the 4 analyses
- ADLO Combination with full Y2K data
- The WW channel
  - the L3 analysis
  - combination with ADLO photonic
- Issues for further development

# LEP-Wide Combination - Photonic

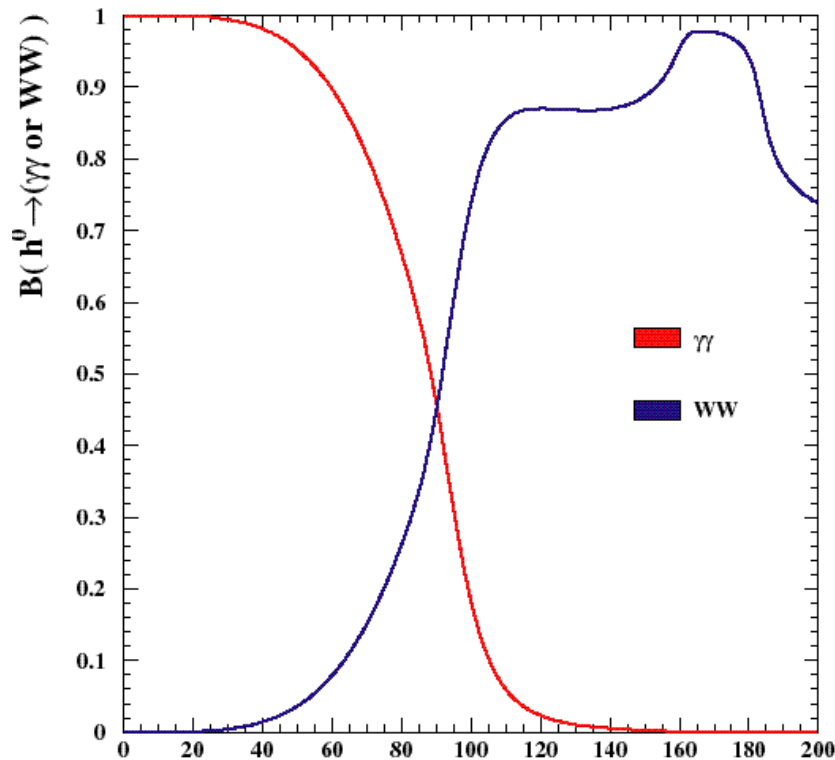
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- **Photonic channel only**, fermiophobic limits are:
  - A: 104.5 GeV (105.1 expected)
  - D: 99.1 GeV (99.6 expected)
  - L: 104.5 GeV (105.4 expected)
  - O: 105.1 GeV (106.4 expected)
  - combined: 109.3 GeV, (107.4 expected)
- For Y2K, **candidates and expected backgrounds:**
  - A: 4            5.1
  - D: 15          14.9
  - L: 37          51.3
  - O: 19          24.2
- Features of the analyses:
  - A: “global analysis” ... no Z decay channels
    - E from 192 GeV
  - D: only qq and neutrino channels
    - E from 189, now Y2K updated
  - L: qq, neutrino, and separate lepton channels (Y2K)
    - E from 189
    - electron channel not mass binned
  - O: qq, neutrino, and aggregate lepton channel
    - all Ecm from 88-209

# ADLO Photonic-only



# The WW Channel



- At this point, current limit is at  $BR(H \rightarrow \gamma\gamma) = 7\%$ , so much to be gained from adding  $WW$
- Inclusion of  $WW$  also leads to more robust model checking
- L3 has developed  $WW$  analysis, presented 010227
  - **general excess seen**, so limit remains at 104.8
  - but still increases expected limit to 108.4 GeV

# Fermiophobic Higgs boson

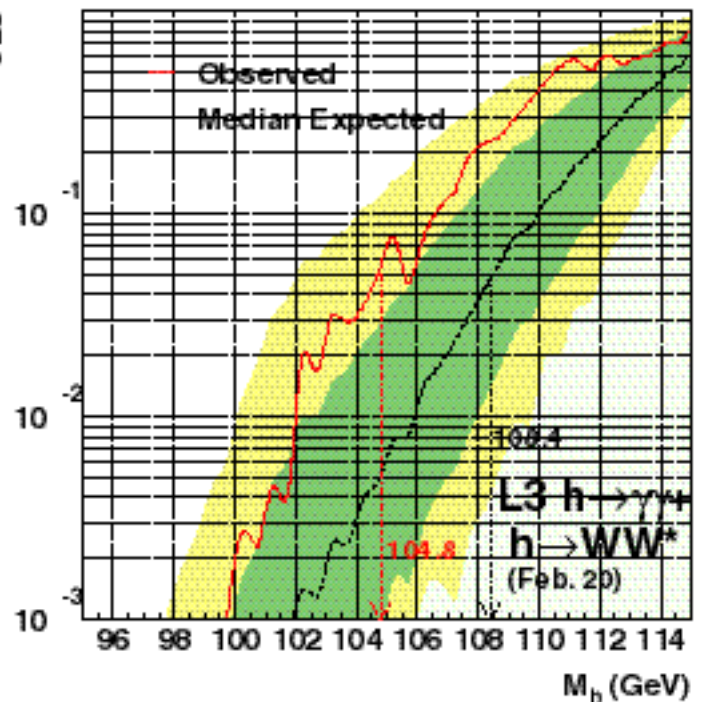
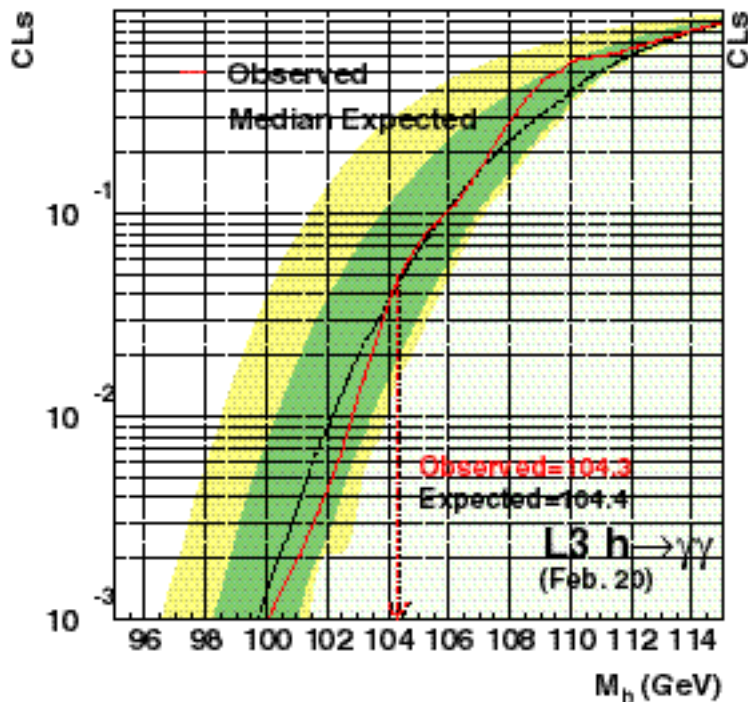


$h \rightarrow \gamma\gamma$

qq	vv	$e^+e^-$	$\mu^+\mu^-$	$\tau\tau$
data	data	data	data	data
exp	exp	exp	exp	exp
56	4	2	2	2
65.8	5.9	4.2	3.5	2.8

$h \rightarrow WW$

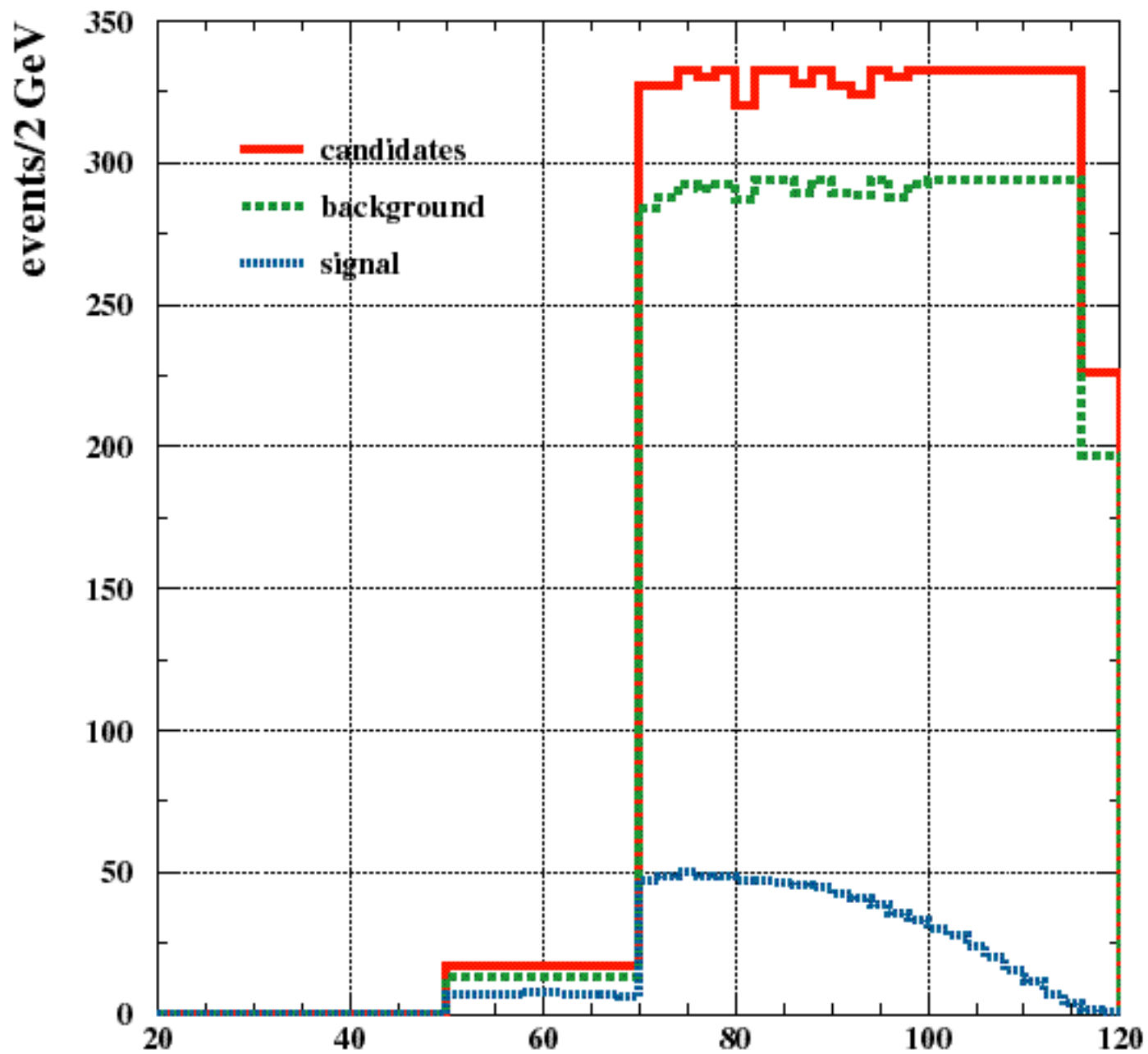
Z ->	qqqq	qq
data	data	data
exp	exp	exp
81	43	43
70.9	36.5	36.5
10	10	10
5.4	5.7	5.7



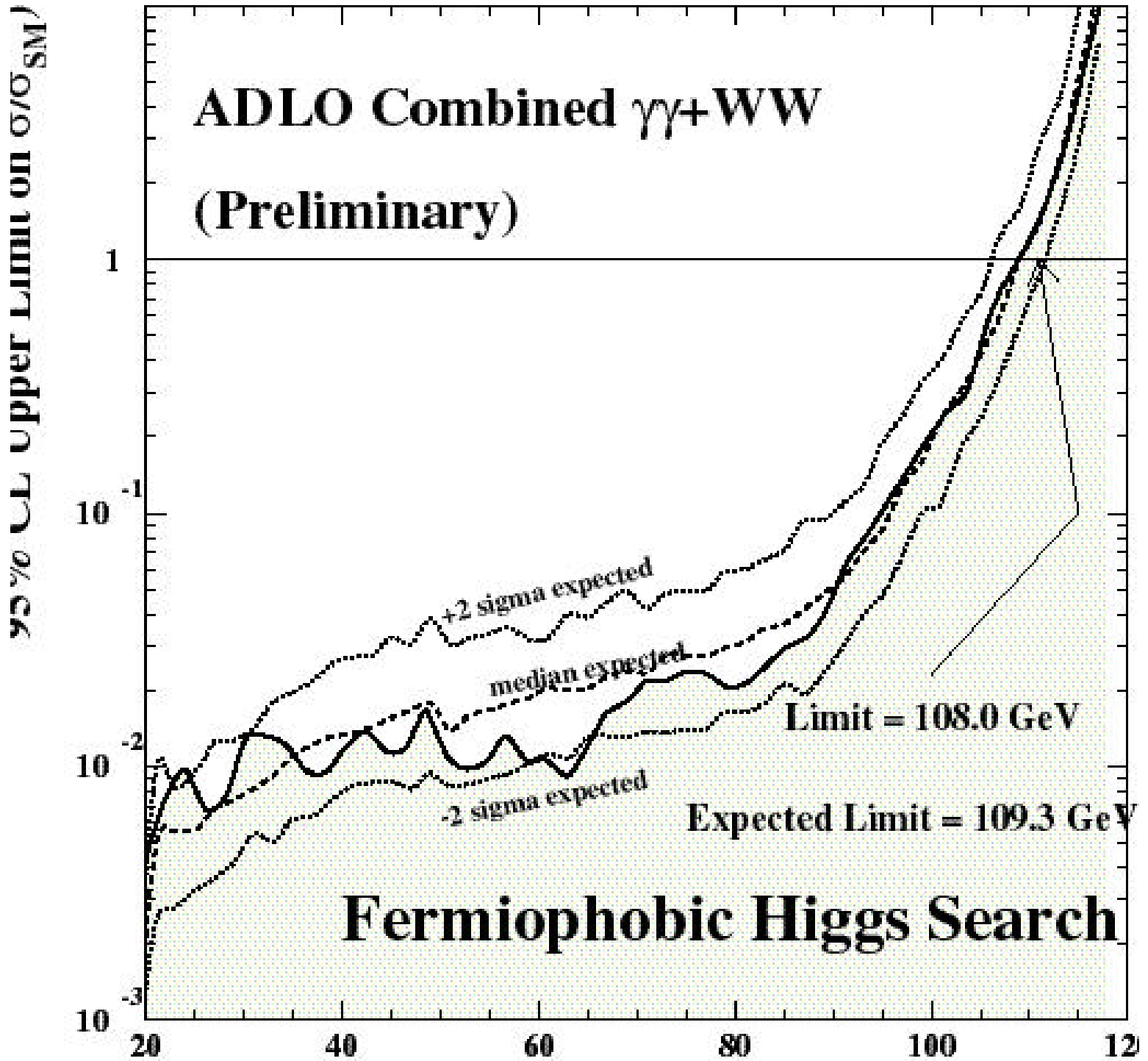
No evidence for fermiophobic Higgs

$M_h > 104.8$  GeV (at 95% C.L.)

# The L3 Components



# ADLO Photonic + WW



# Open Questions, MJO Desires

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- All the other experiments have either:
  - looked at WW in the past (D,O did not feel enough to be gained in quick early studies)
  - A is about to set a student on it!
  - O will try to find someone to finish the work
- I do not feel the WW combination is all the way there:
  - Princeton is working on its own LEP combination for verification of my results
- We have not had time to think about the best ways to present the photonic, WW, and combined data
  - I'd like to get away from model dependence as much as possible
  - Remember: turning off the fermion couplings in HDECAY/HZHA is just a benchmark
  - We should show cross section upper limits
- I'd like to see the standard inputs in a format where mass plots can be generated
  - used to be the case ...
  - helps me check for problems
  - nice summary of what the searches yield