Status of
THE HIGGS SEARCH WITH L3

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on behalf of the
L3 Collaboration

Status of searches in 4jets, jets+$\not{E}$, jets+lepton pair channels
Most significant candidates

Luminosity analysed(1/pb)

	LEPC Sept.5	since LEPC	Total Oct.27
Ecm $\leq$ 206.5 GeV	76.3	+13.5	89.8
Ecm > 206.5 GeV	68.3	+42.7	111.0
all energies	144.6		200.8

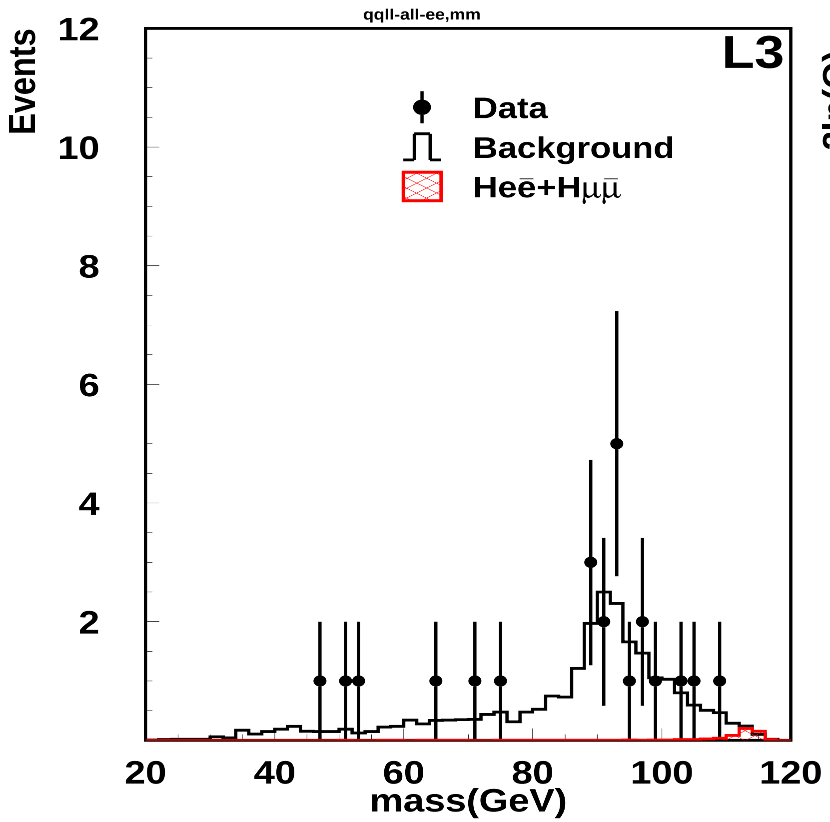
Today's results are based on this luminosity

All results are preliminary

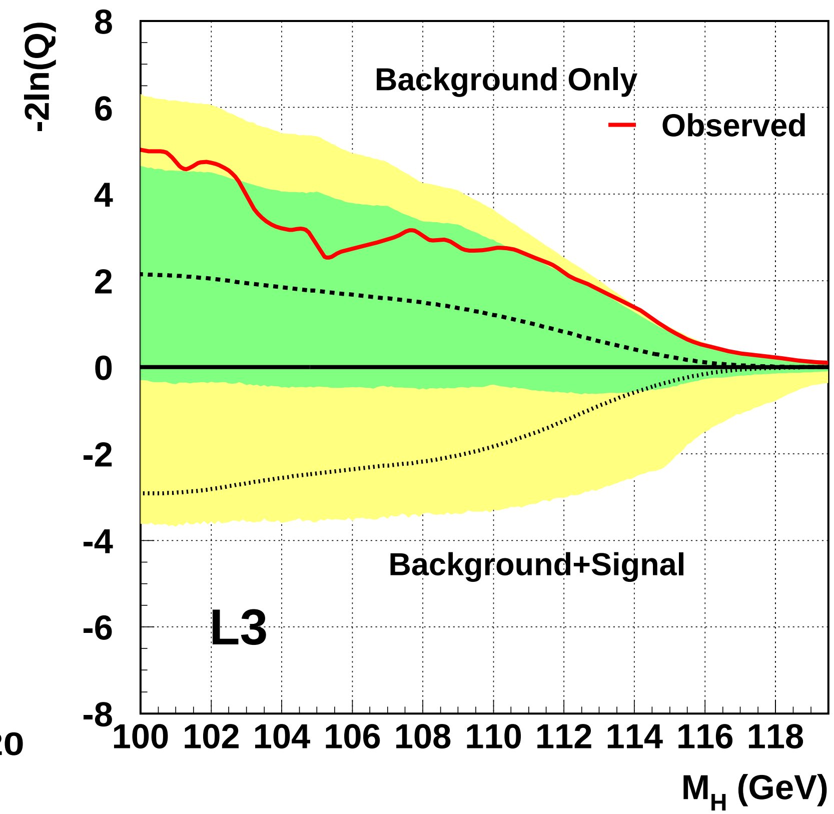
all quoted Higgs signal expectations are for M_H=114 GeV unless specified otherwise

Search in the jets+lepton pair channels

mass distribution for qqee and qq$\mu\mu$ events



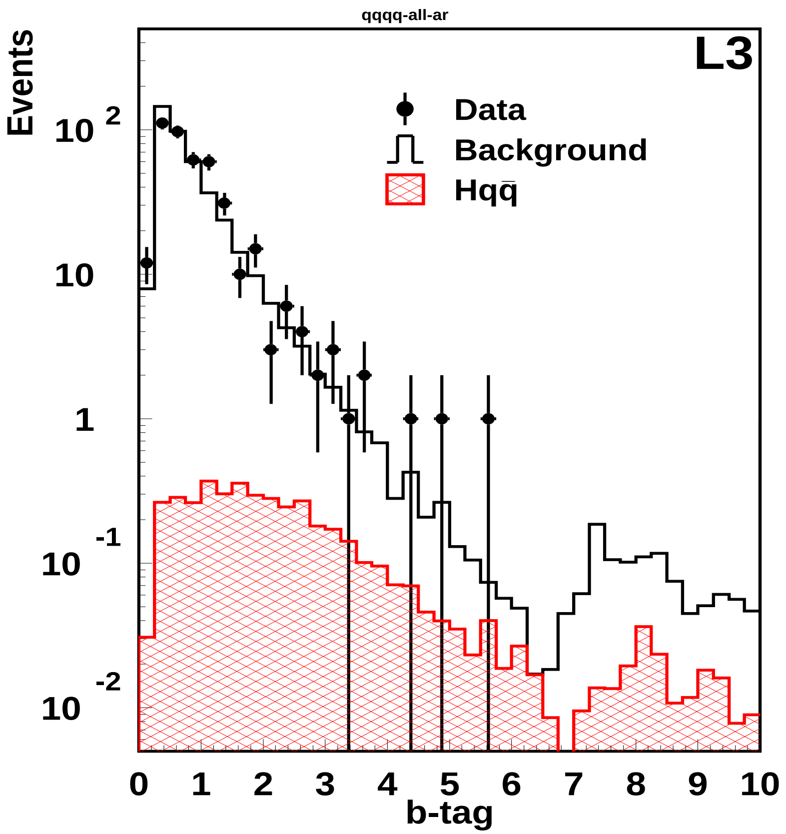
Likelihood ratio plot for jets+lepton pair channels



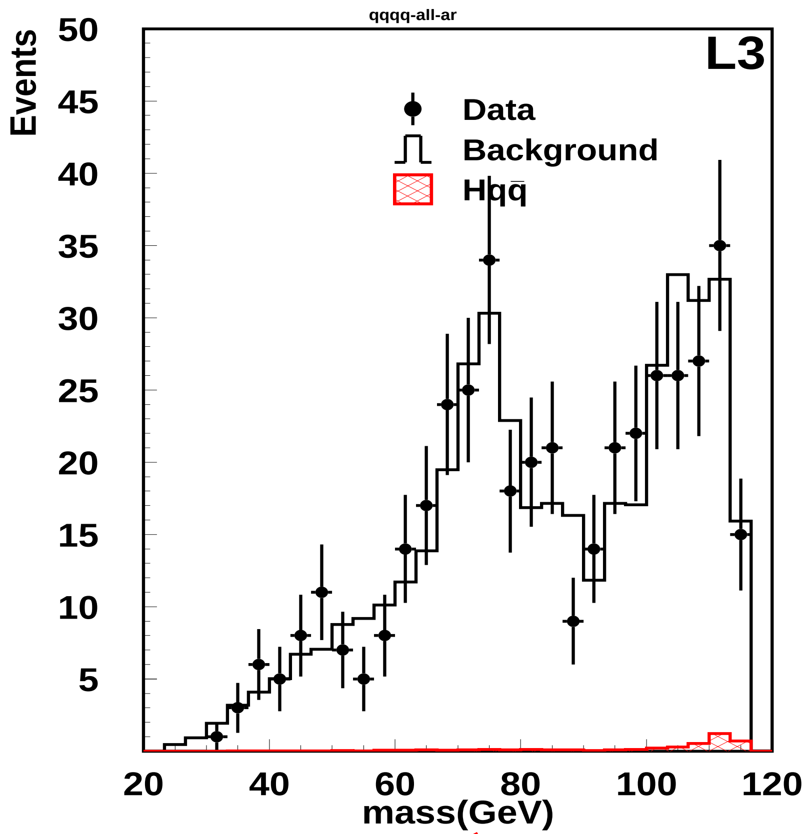
good agreement of the data with expected SM bkgd
no significant Higgs candidates observed in these channels

Search in the 4jets channel

b−tag for 4jets events



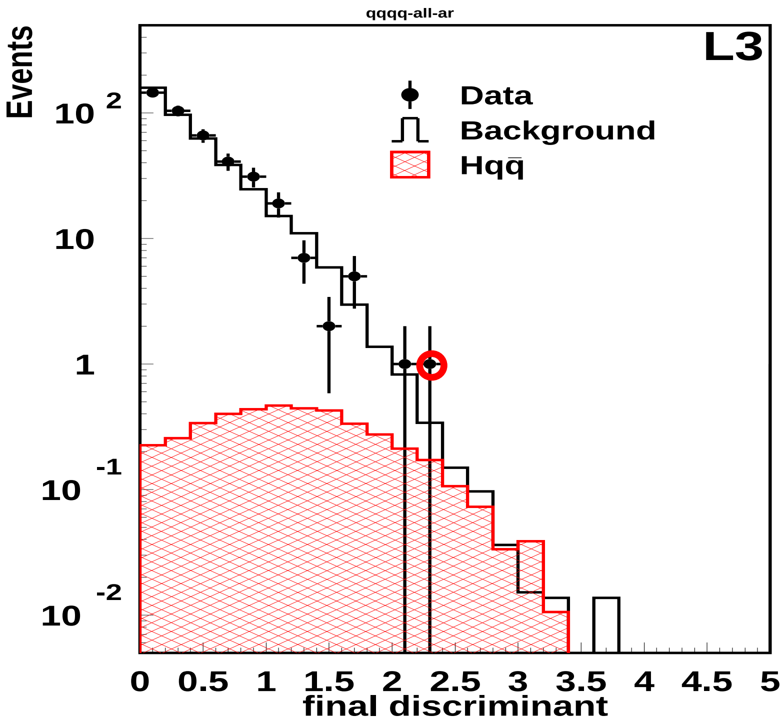
reconstructed Higgs mass



Final discriminant

Search in the 4jets channel

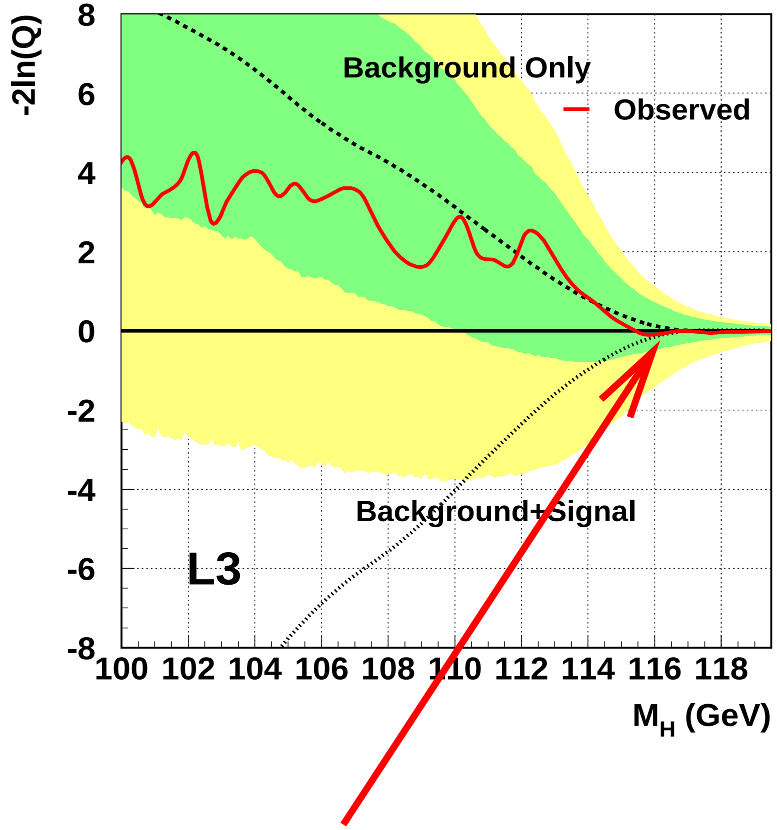
Final discriminant



○ most significant candidate for a 114 GeV Higgs

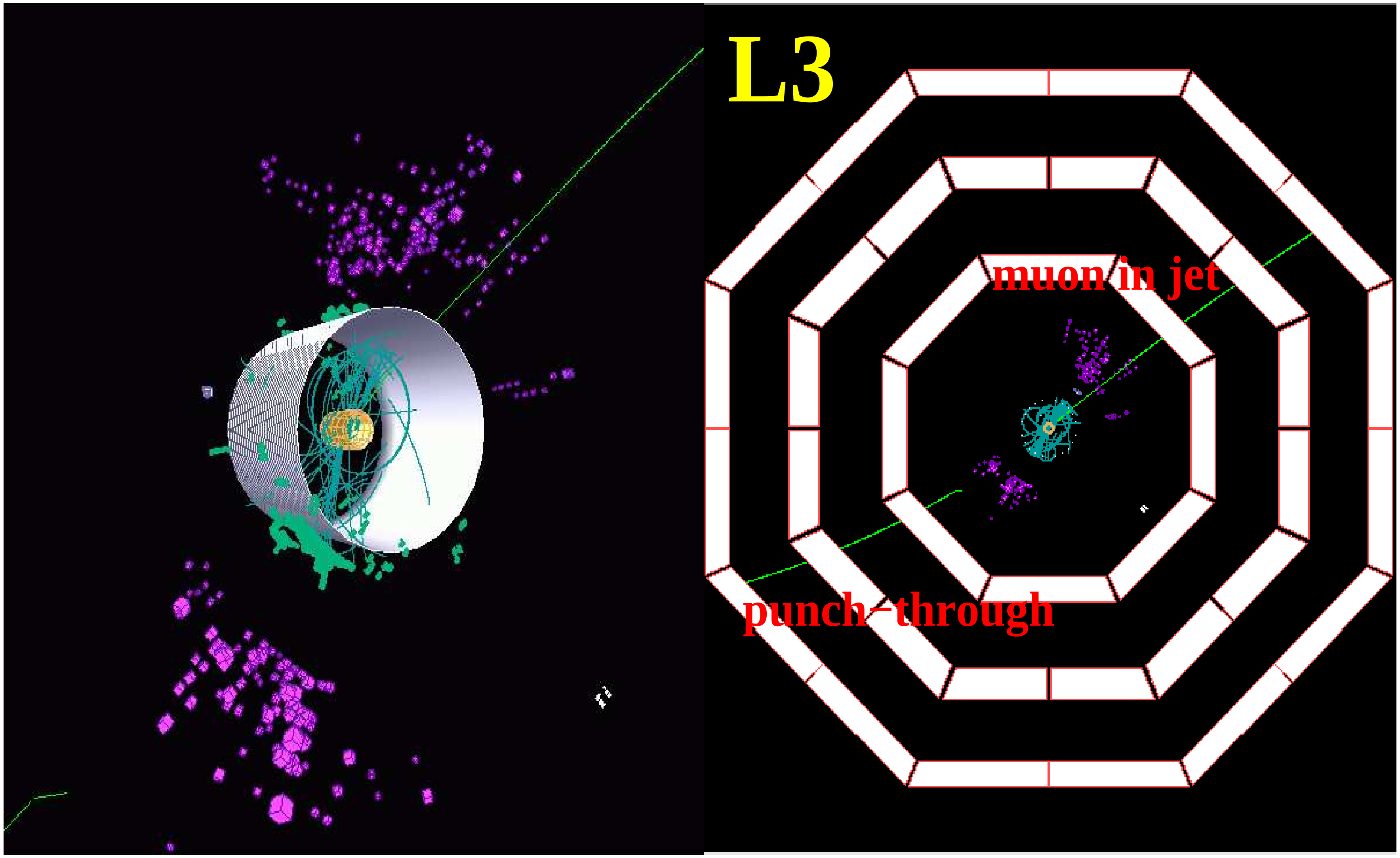
mass (GeV)	btag	s/b	Ecm (GeV)
114.6	3.63	0.82	206.7

Likelihood ratio plot for the 4jets channel



significant 4jets candidate

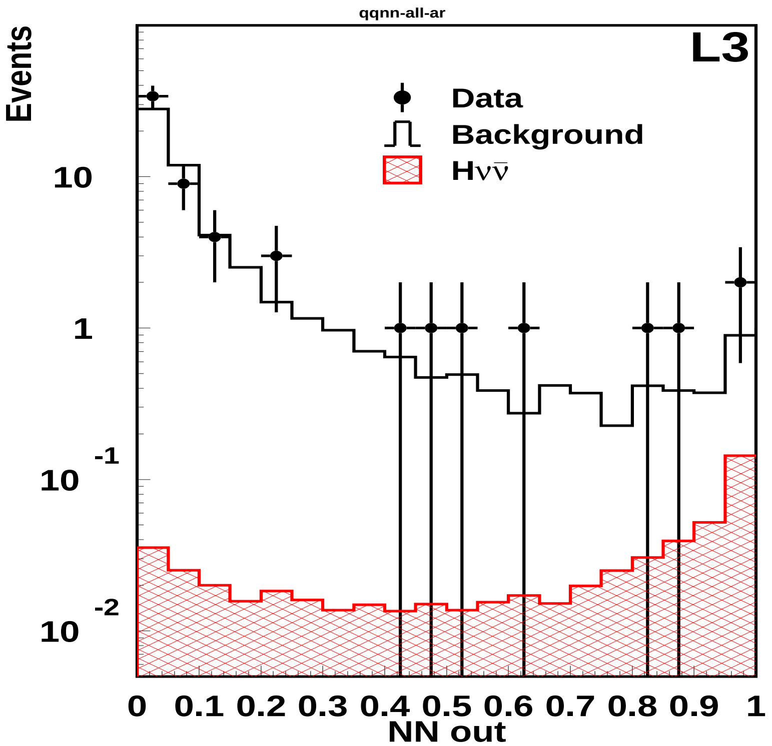
most significant Hqq candidate



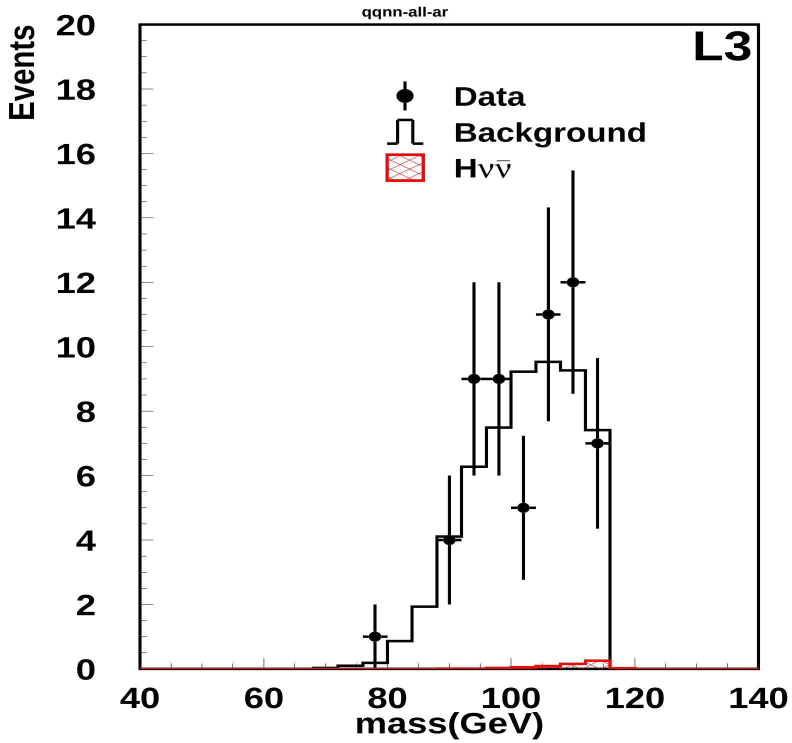
measured Higgs mass=114.6 GeV   mass resolution~4 GeV

Search in the jets+missing energy channel

Neural Network output



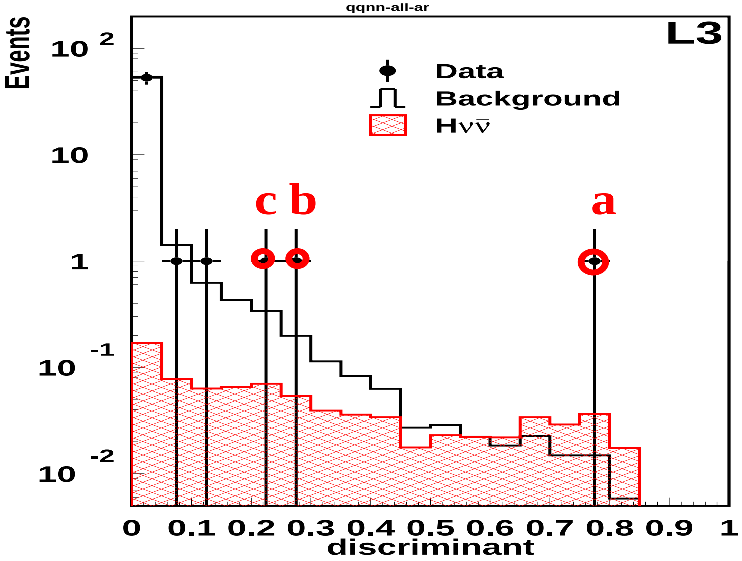
Reconstructed Higgs mass



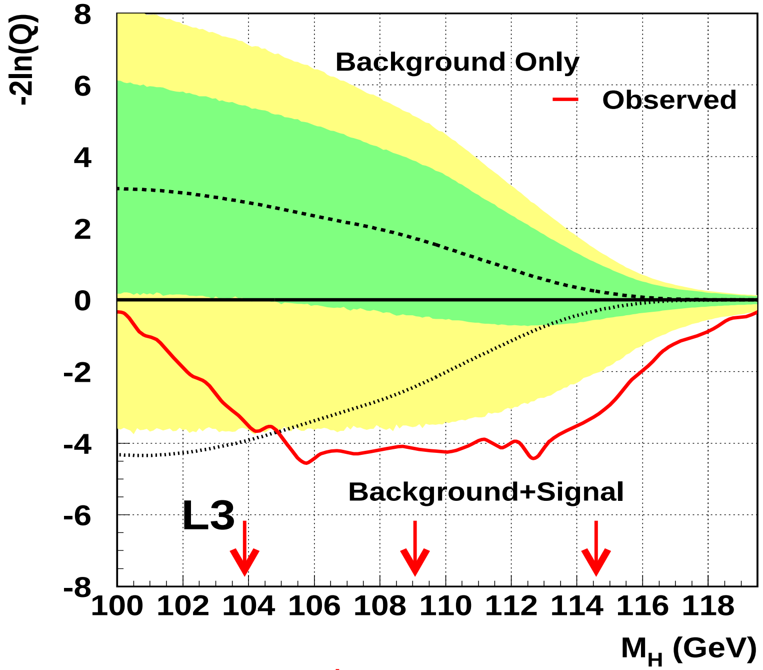
Final discriminant

Search in jets+missing energy channel

Final discriminant



Likelihood ratio plot for jets+missing energy channel



↓ candidates

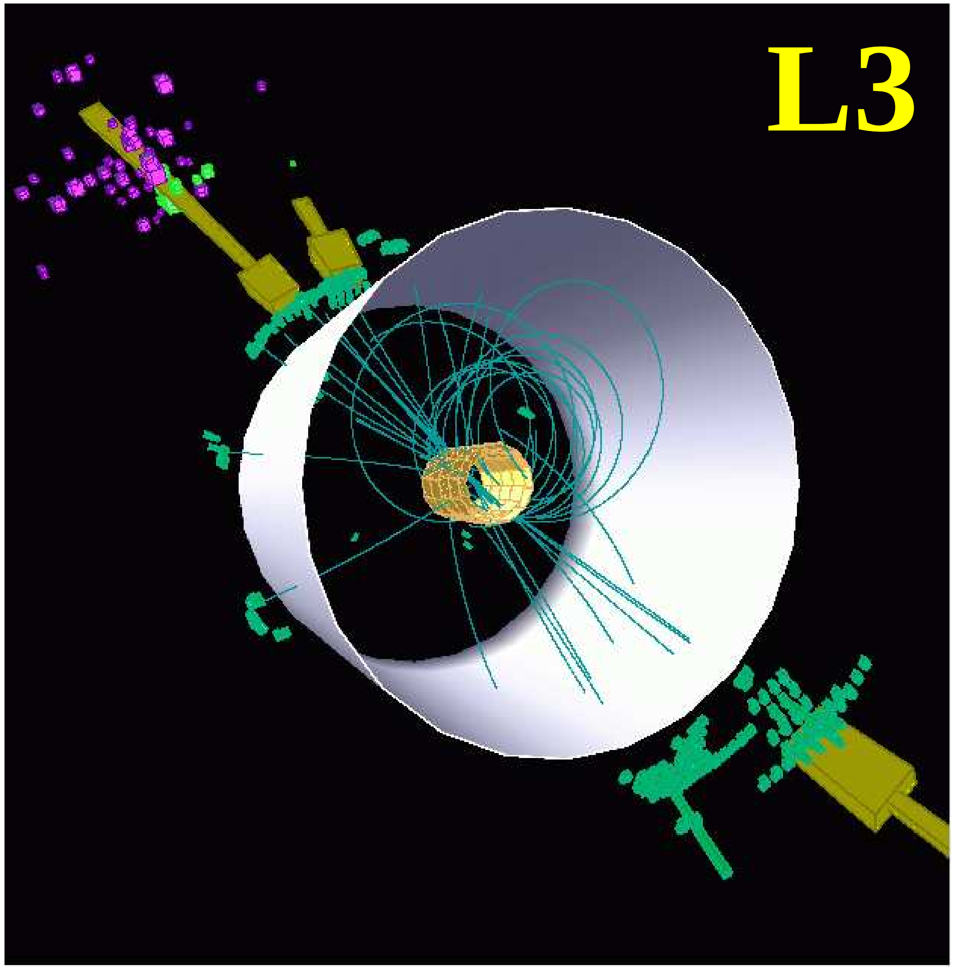
significant candidates

	mass (GeV)	btag	NNout	s/b	Ecm (GeV)
a	114.4	3.26	0.999	2.6	206.6
b	103.7	3.14	0.985	0.27	206.6
c	108.9	2.96	0.890	0.20	206.8

s/b is for 114 GeV Higgs mass hypothesis

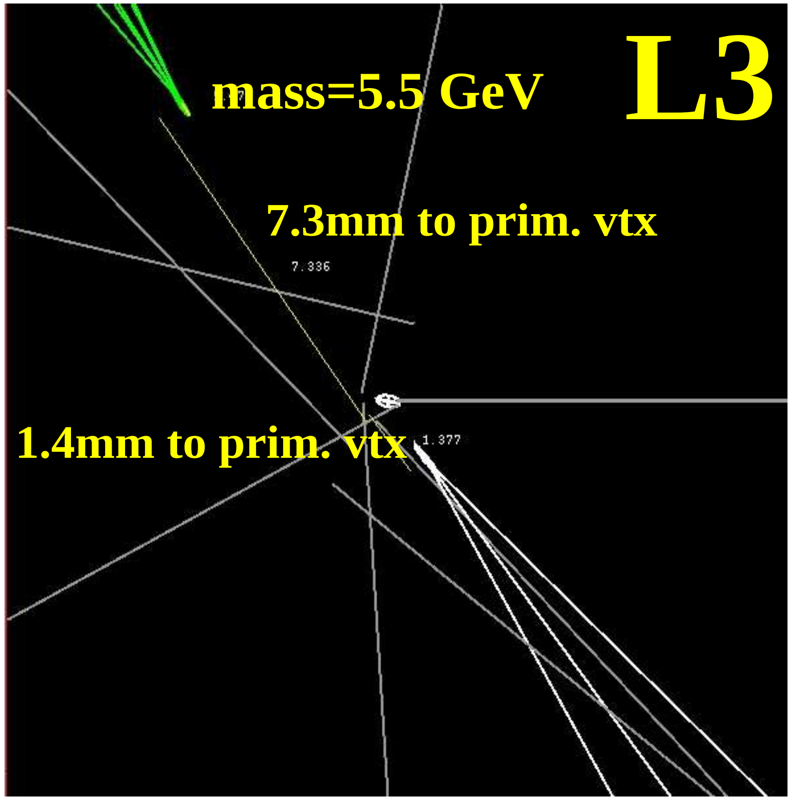
s/b ratio calculated for the bin of the final discriminant where the candidate lies.

most significant Hνν candidate



measured H mass=114.4 GeV
H mass resolution ~3 GeV

Secondary vtx's view

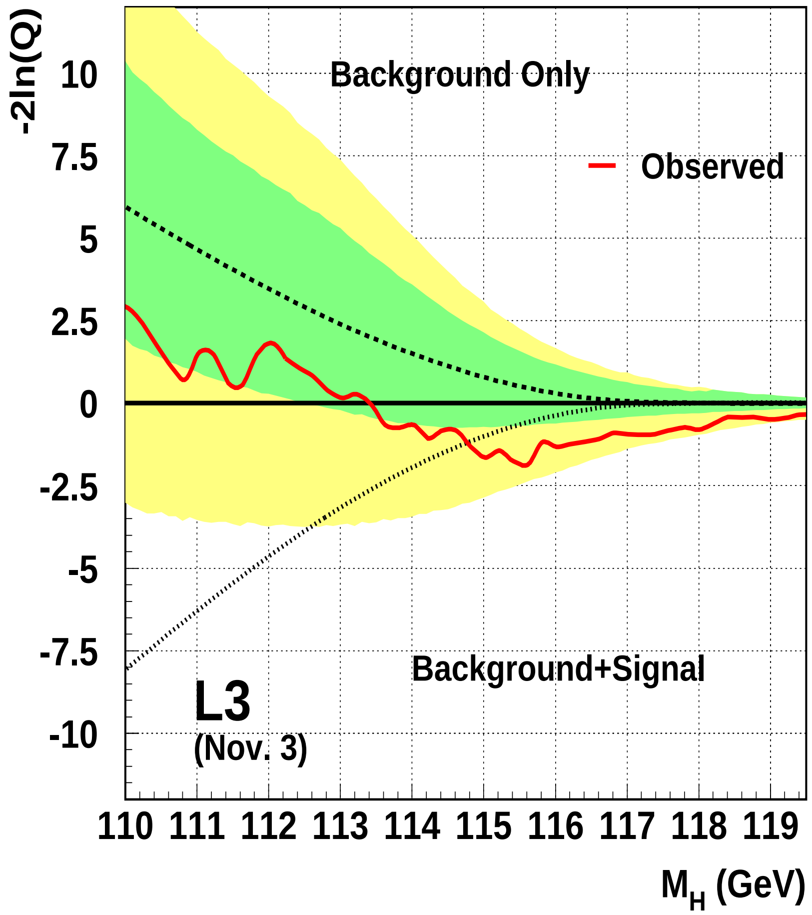


Combined L3 result

If you like to see numbers here is an example
Number of events for S/B=>1
(S/B is after a cut on the discriminant and integrating over all bins right of the cut)

	Data	Bkgd	Signal
4jets	1	0.435	0.441
$qq\nu\nu$	1	0.220	0.235
qqll	0	0.112	0.119
$qq\,\tau\tau$	0	0.080	0.100

combined likelihood ratio plot



Conclusions

Two significant high mass candidates observed

in the data collected after Sept.5

one in the missing energy channel

the other one in the 4 jets channel

THIS OPENS VERY EXCITING PERSPECTIVES!!!

To turn observation into discovery

L3 wants to run in 2001

at c.o.m. energy~>208 GeV with a luminosity~>200/pb