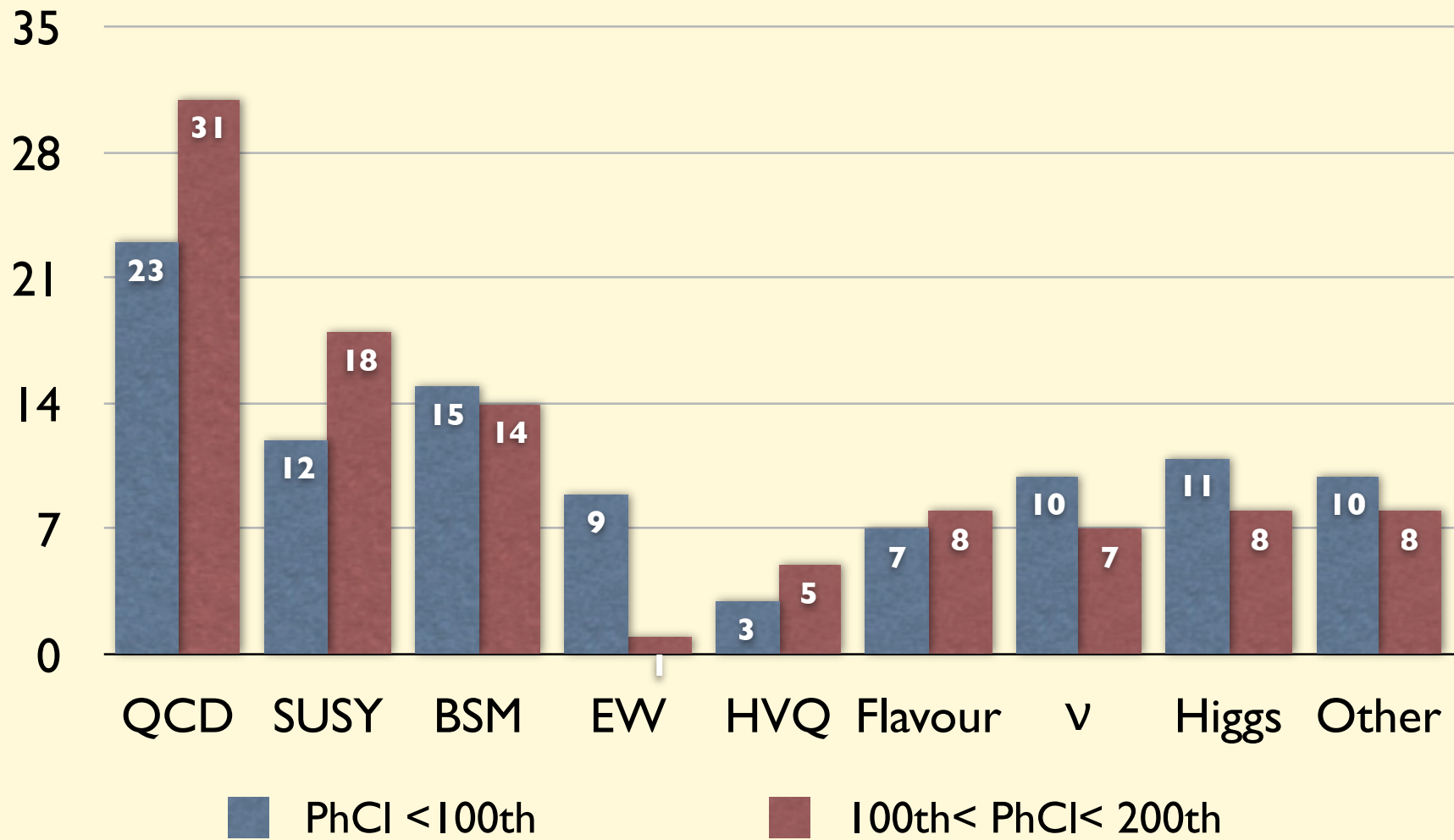
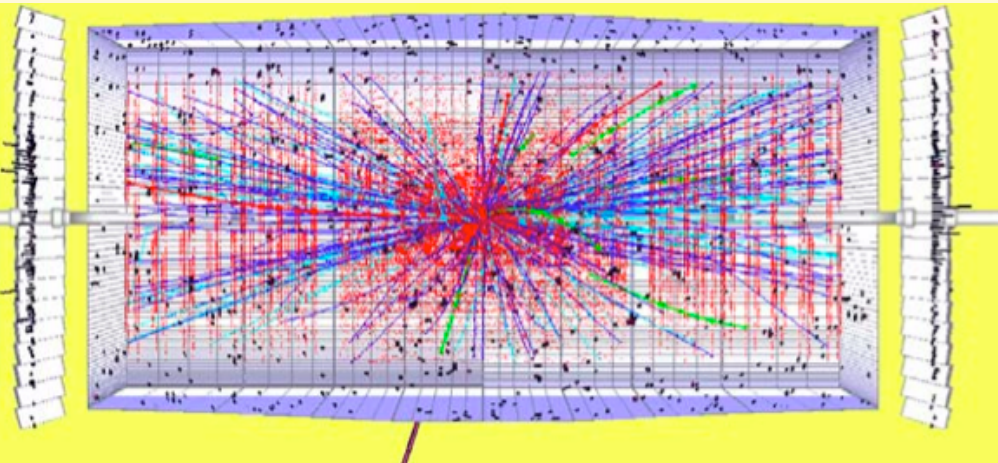


Happy 200th PhenClub!

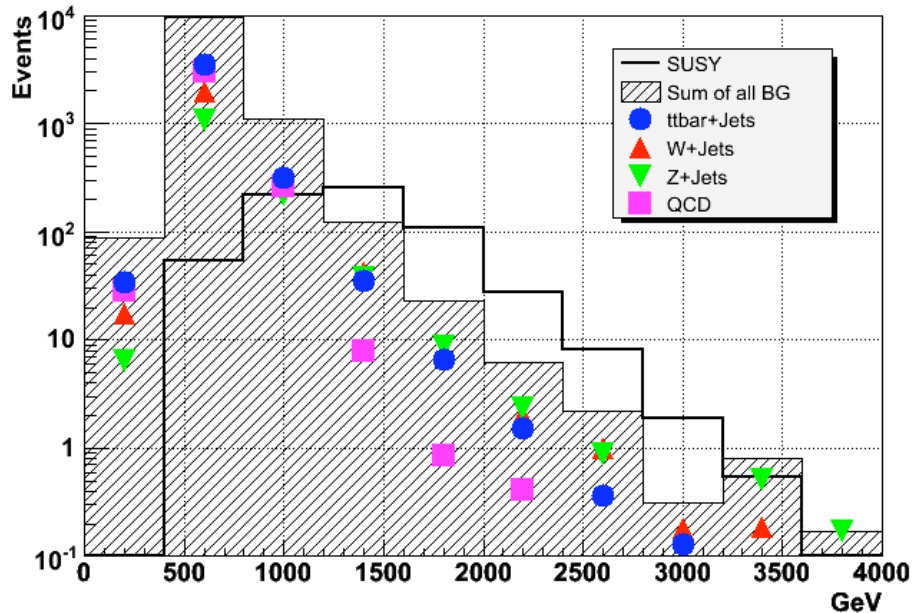
Topics' distribution



Forthcoming challenges

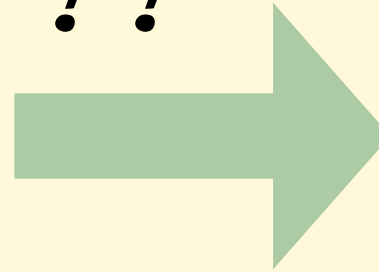


Effective Mass 0lepton SUSY



$$M_{\text{eff}} (\text{GeV}) = \sum_{i=1,4} E_T (i) + E_T^{\text{miss}}$$

??



??
!

extra dims?

gluinos?

squarks?

\mathcal{L}

What can we expect at the beginning?

Some history:

- **Fall 1982:** first physics run for UA1 and UA2 at the Sp̄p̄barS
 - $L_{\max} = 5 \times 10^{28} \text{cm}^{-2}\text{s}^{-1} \approx 1\%$ asymptotic L
 - $L_{\text{int}} = 20 \text{nb}^{-1}$ in 30 days

outcome: W/Z discovery, as expected

ingredients: plenty of kinematical phase-space (ISR was sub-threshold!), clear signature, and good hands-on control of backgrounds

- **Summer 1987:** first physics run for CDF at the Tevatron
 - $L_{\max} = 5 \times 10^{28} \text{cm}^{-2}\text{s}^{-1} \approx 1\%$ nominal L
 - $L_{\text{int}} = 20 \text{nb}^{-1}$ in 30 days

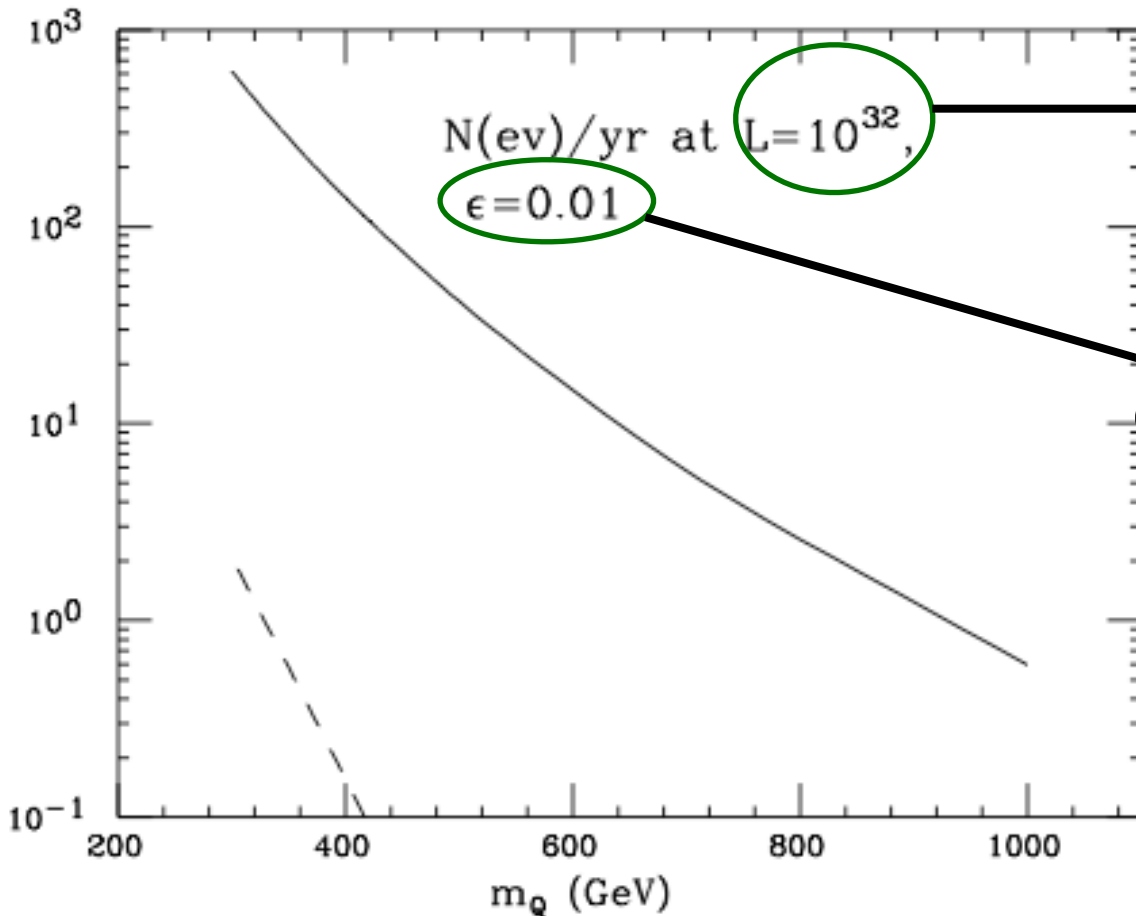
outcome: nothing exciting, as expected

why: not enough phase-space, given the strong constraints on new physics already set by UA1/UA2!

At the start of LHC, the situation will resemble much more that at the beginning of UA1/UA2:

The phase-space for the Tevatron will have totally saturated the search boundary for most phenomena, at a level well below the LHC initial reach: seen from the LHC, the Tevatron will look like the ISR as seen from the SppS!

Rates 10^3 times larger in the region of asymptotic Tevatron reach

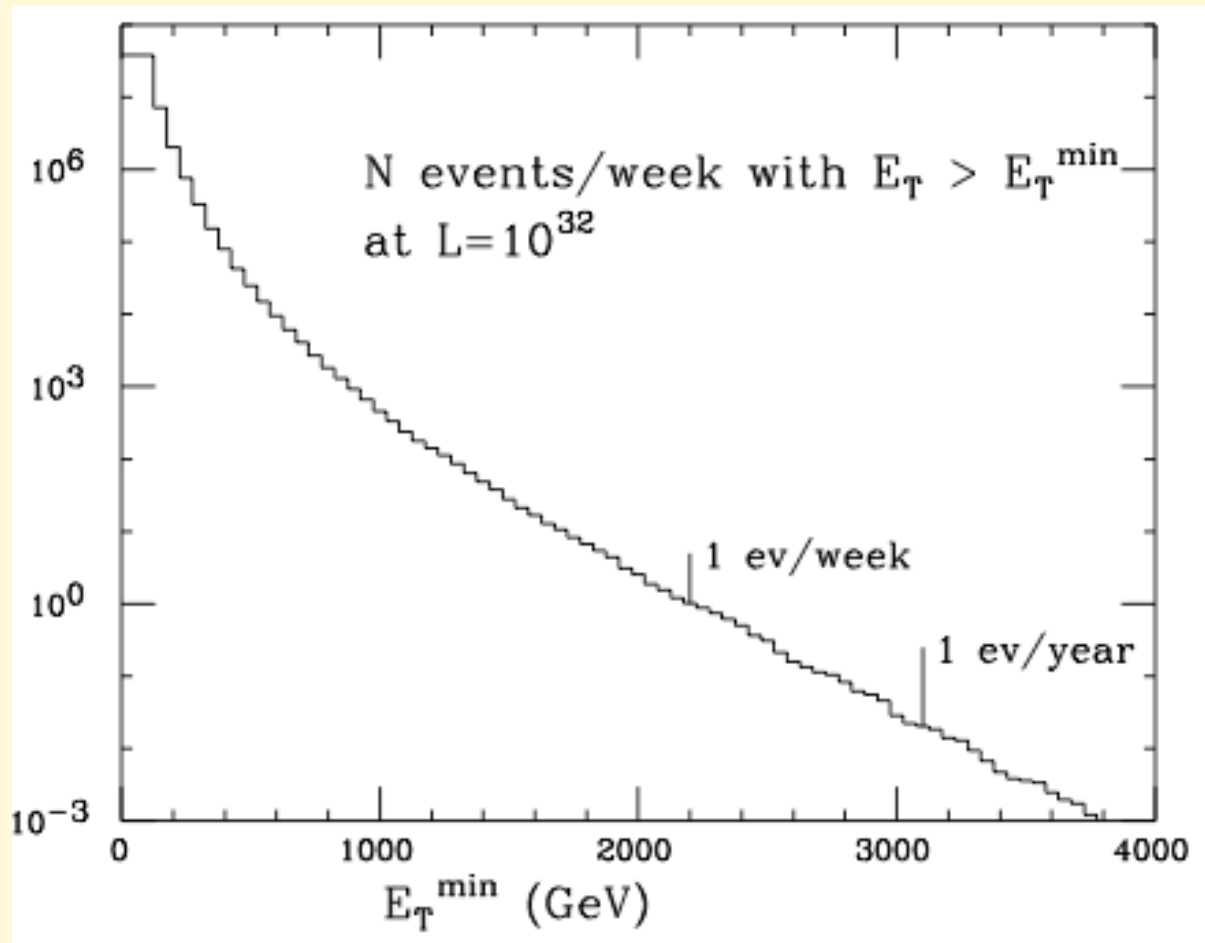


1% of L_{max} for the LHC, (as in SppS and Tevatron early runs), close to L_{max} for Tevatron

(assume a 1% signal efficiency)

N.B.: rates for gluino production are roughly a factor of 10 larger than for HQs

Similar considerations hold for jets, where few days of data will probe quarks at scales beyond the overall Tevatron CM energy!



SM-like Z' :

$Z' \rightarrow ee, SSM$

Mass	Expected events for 10 fb^{-1} (after all cuts)	$\int \mathcal{L} dt$ needed for discovery (corresponds to 10 observed evts)
1 TeV	~ 1600	$\sim 70 \text{ pb}^{-1}$
1.5 TeV	~ 300	$\sim 300 \text{ pb}^{-1}$
2 TeV	~ 70	$\sim 1.5 \text{ fb}^{-1}$

PhenClub in the LHC era

- **Preferred forum for discussion of LHC-related topics:**

- progress of the accelerator
- first data
- rumors
- brainstorming
- MC tunings
-
- ⇒ engage some young experimentalist in the organization ?

- **More open to the outside:**

- VRVS [meeting room, timing (US/Japan), ..]
- archiving
- PhenBlog
-

Happy 200th PhenClub

**Congratulations and thanks to
all those who made it possible!**

Sabine Kraml Giulia Zanderighi Agustin Sabio Vera
Pietro Slavich Robert Harlander Thomas Teubner
German Rodrigo Mrinal Dasgupta Torsten Feldmann
Laura Covi Adam Ritz Sven Heinemeyer Stephan Huber

**Best wishes for a
brilliant future!**