

WORKING GROUP: TOOLS FOR NEW PHYSICS

Les Houches 2011 - Session 2 - Introduction



P. Skands (CERN) - June 2011

NEW PHYSICS PIPELINE

Particle Spectra
Couplings (& running)
Feynman Rules
Amplitudes

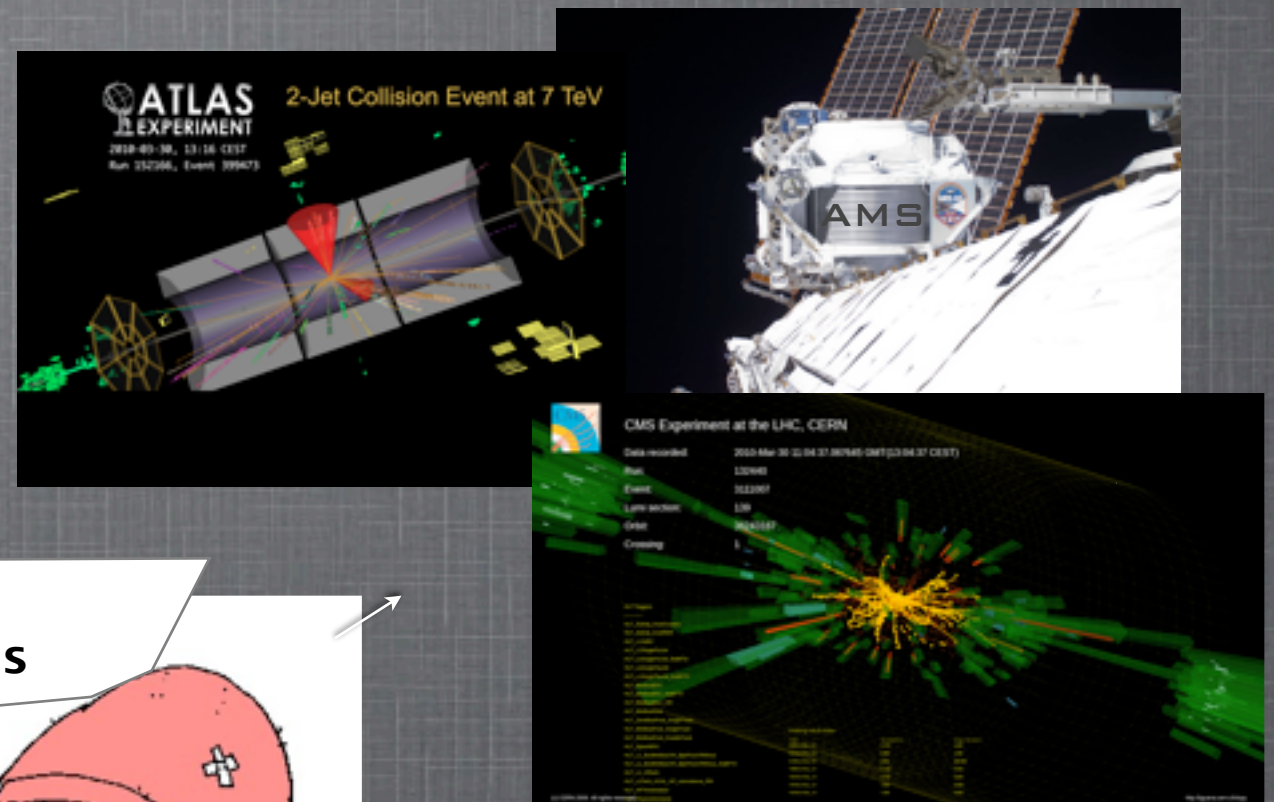
Phase Space
Cross Sections
Particle Decays
Higher Orders

Radiation
Underlying Event
Hadronization

Jet Algorithms
Detector Simulation
Propagation

Luminosities
Pile-Up

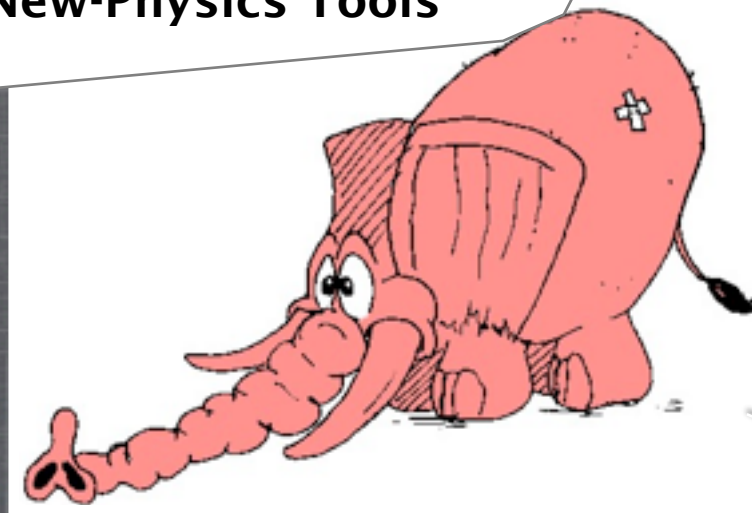
Confrontation with Data



New-Physics Tools



L=...



Development of
Strategies and
Observables

New-Physics Tools: Organization

Conveners:

P. Richardson, P. Skands, F. Moortgat



Our Role:

To help organize discussions

To help organize the wiki pages (*please use them!*)

http://lappwiki01.in2p3.fr/LesHouchesIWiki/index.php/Tools_and_Monte_Carlos

To help organize proceedings → later ...

Topics

Conveners have a list of possible interesting topics to use as a baseline. **Not exhaustive nor exclusive.**

Declare your interests

- We'll collect a list of possible projects with at least one name (preferably two or more) attached to each one
- We'll put these on the wiki and add/remove as necessary.
- Each will have its own wiki page (→ proceedings contribution)

Schedule on the Wiki

Day	WG NLM	Example from LH 2009	WG MC
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Tue 9

14:00 **Auditorium WG NLM General Meeting :**

- organising session 1
 - discuss projects
 - sign up to subgroups

16:00 **Auditorium** Joint session with WG MC

- discussion on pdf, special guest: Jon Pumplin
 - Projects at Les Houches

17:00 **Auditorium**

- **NLM + MC Matching** : Brainstorm 1
 - Projects at Les Houches

Wed 10

16.00 **Auditorium** Joint session with WG MC

- **Matching** Subgroup: Spillover from yesterday

See [Tools and Monte Carlo Session 1 \(SM\)](#)

14:00 **Library**

- **Matching** Subgroup: Brainstorm 1 (without NLM):
 - Projects at Les Houches

16:00 **Auditorium**

- **JOINT WG NLM + MC Brainstorm Meeting** (see NLM)

09:00 **Auditorium**

- **Tuning** Subgroup: Brainstorm
 - Projects at Les Houches

11:00 **Auditorium**

- **Data/Theory Comparison and model (in)dependence**
Subgroup: Brainstorm
 - Projects at Les Houches

14.00 **Auditorium**

- **Jet Physics** Subgroup: Brainstorm
 - Projects at Les Houches

16.00 **Auditorium** Joint session with WG NLM

- **Matching** Subgroup: Spillover from yesterday

Get a wiki account!

After first few days, organization will be more dynamical → **up to you**

Think something needs to be discussed? **Book a room!**

Kickoff Discussions

The next few days

- Aim: to see if there is critical mass for “topic X”
 - (or just to discuss it with each other)
- *Anyone can schedule a kickoff discussion*

Please be careful to avoid problematic overlaps in time and/or topics: if in doubt, coordinate with conveners

Use the blackboards and/or the schedule on the wiki

Les Houches = work together (if there isn't critical mass for your favourite topic, look for something else)

Some Issues

- Jet substructure and boosted objects (e.g., observables, MC models, pile-up tools, and model tests on known processes)
- Complex Signals and Multi-Jet Matching
- Effects of MC tuning on BSM studies (e.g., systematic variations to estimate modeling uncertainties - e.g., in context of W_{jj} ?)
- Methods and Tools for Spin Correlations
- Improving Generic new-physics tools (e.g., FeynRules, LanHep, MadGraph, CalcHEP, ...)
- New (types of) models in existing tools (E.g., tools for more general SUSY/XD/... scenarios, coloured exotics: sextets, colour epsilons, R-hadrons, new QCD-like sectors, hidden valleys, ...)
- Tools for Dark Matter (& interplay with colliders)
- NLO for BSM?
- Extreme Widths (tools for models with very small or very large widths, e.g., Heavy Higgs)
- Statistical Techniques, Multivariate methods, Tools for Fitting/Constraining Models
- Discussions & Tutorials
- SLHA, FLHA, etc: news, revisions, things not working, ... ?

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→ **KICKOFF DISCUSSIONS**

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Welcome to Les Houches



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Come to the KICKOFF DISCUSSIONS