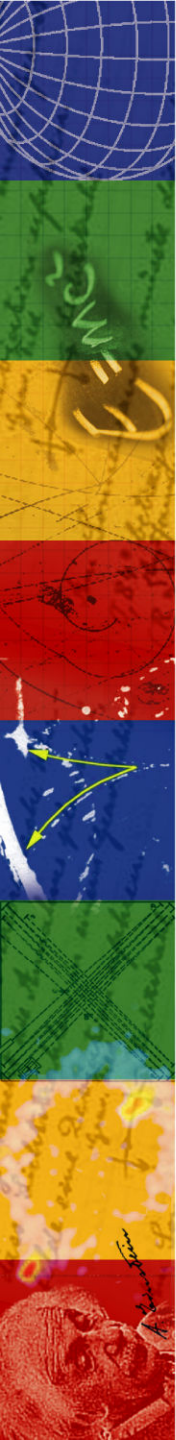




***Summary of
International Masterclass@LHC premeeting
focus: ATLAS+CMS***

Michael Kobel

16.4.2010

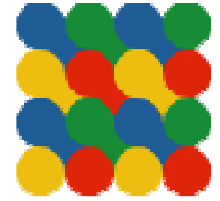
- 
- A vertical decorative bar on the left side of the slide, composed of several horizontal panels. From top to bottom: a blue grid pattern, a green panel with the letters 'CM' in white, a yellow panel with a white particle track, a red panel with a black particle track, a blue panel with a white particle track and yellow arrows, a green panel with a white grid, a yellow panel with a white particle track, and a red panel with a white particle track.
- Topics of discussion
 - Learning objectives
 - Physics concept
 - Open questions
 - Schedule

Learning Objectives (LHC)

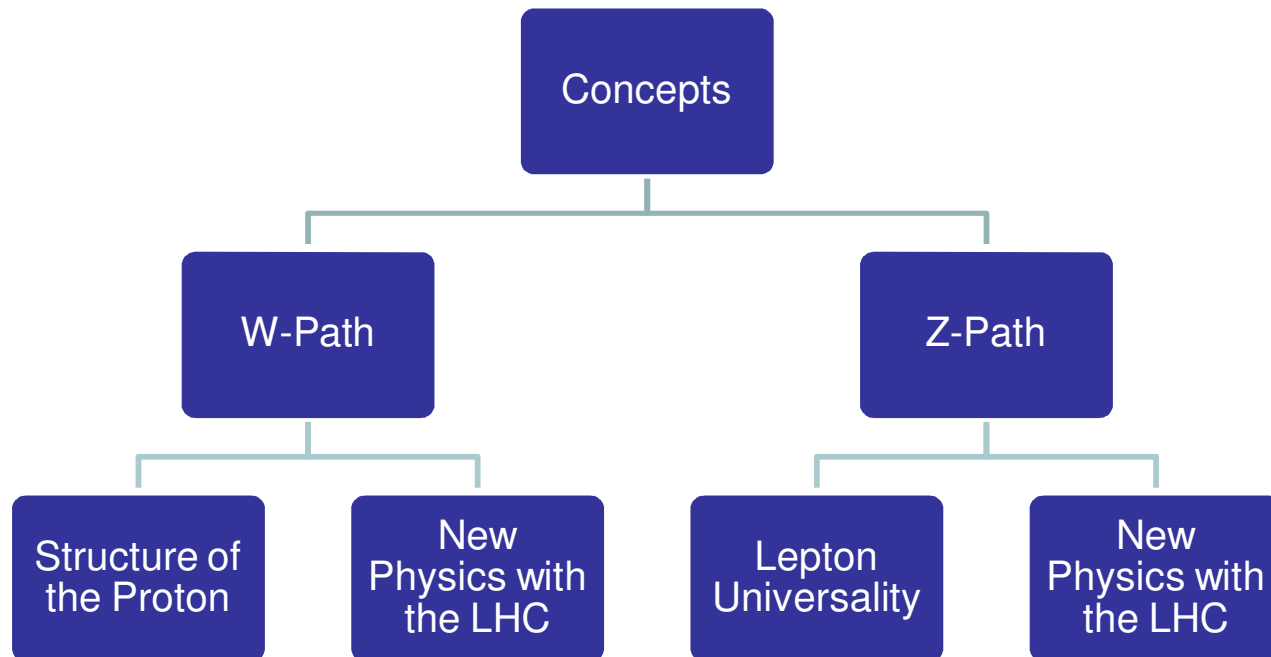
- ***few* (one or two) central aims**
 - **1.) Closely follow the scientific research process**
 - Do what the LHC is currently doing: rediscover known things (e.g. W and Z)
 - Grep the idea why the LHC is built: how to discover new things (e.g. Higgs) understand why it takes so long
 - **2.) Get fundamental insights via the own measurement**
 - Keep concept of comparing and combining measurements
 - Help students understand what is fundamental (if needed)
 - Let the students themselves interpret their results
- **Need some concepts and tools to get there**
 - Identifying different particles
 - Concept of missing energy = Neutrinos in SM
 - Concept of signal and background events
 - Concept of counting and comparing numbers of events



Physics Concept (ATLAS + CMS)



The **aim**: *Developing concepts that reflect the true motivation for the LHC (New physics) and allow to get deep insights (fundamental measurements)*



Open questions (ATLAS + CMS)

- How to weigh: measurement .vs. New physics ?
(i.e. single W or single Z .vs. WW and ZZ)
 - Skip WW (resp. ZZ) completely?
 - Just grep the idea (few MC events in sample)
 - Do detailed interpretation of WW (resp. ZZ) from new physics in contrast to SM (e.g. angular or mass distributions)
→ *not* on the agenda for the next 3 years!
- How far should we „tweak“ the preselection
 - $Z \rightarrow ee$ as frequent as $Z \rightarrow \mu\mu$: easy
 - $W_+ / W_- = 2$ not so easy, might need correction factor (not too different from 1.x)
- Pragmatic solution
 - Try out and evaluate

Schedule (LHC)

- Need ready-to use tool to use in summer
 - All: Measurement description for students needed
 - ATLAS: (using HYPATHIA and MINERVA)
latest July , test starting in July(?) latest in August
 - CMS: ???
 - ALICE: test starting in September
- Aim:
 - ATLAS+CMS international masterclasses from 2011 onwards
 - Open: when introduce single days for ALICE?