GDR-Inf "Hand's On" project:

Combination and interpretation of experimental results

Start-up meeting, 30/09/2020

Intro

Theoretical interpretations or combinations of experimental measurements are affected by :

- theoretical assumptions underlying the experimental result,
- correlations among statistical and systematic uncertainties,
- the way the experimental result are published,
- ...

Q : Can this be improved ?

Goal of the project :

- identify use cases where this problem arises
- propose way out that could eventually be studied beyond the scope of this workshop.

Organisation

This is more brainstorming than a "Hand's On" project

Workplan:

- Meeting #1 (today): Discussion & definition of the goals of the project
  - Home work : Search for relevant/typical cases, experimental measurements or theoretical studies. In which cases one could have done a better job with some supplemental information ? What are the unnecessary assumptions that needed to be made ?
- Meeting #2 : Review of the identified cases and selection of some relevant examples.
  - Home work : Analyses of the problems encountered in the selected cases and possible solutions.
- Meeting #3 : Synthesis

Tools ?

- Mattermost : "Hands-on": combination and interpretation of exp. results channel ?

Some ideas

- an experimental result that depends on another (external) one (e.g. LHCb RD* or BR(Bs->mumu)) that is significantly improved after publication
- combination of DeltaMs likelihoods before the actual measurements (non Gaussian regime)
- first measurements of |Vub|, that were plagued by a large theory model dependence, that could not always be taken into account consistently when used in a global phenomenological analysis
- an experimental analysis that depends on a specific assumption that one would like to relax in the interpretation. For example some of the b->sll measurements assume that the lepton is massless, which is not a good approximation in specific regions of the phase space
- a given New Physics search has been performed in a specific scenario, but is interpreted in a different one

Homework: dig into your past experience to find examples where you needed more information from theorists/experimentalists, beyond publication content !

Round table