

Higgs cross-section group

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The ATLAS and CMS Higgs communities wish to create a forum for the discussion of Higgs cross-section issues common to both experiments.

The aim is to produce agreement on cross-sections, branching ratios and pseudo-observables relevant to the Standard Model and Super-symmetric Higgs boson(s). This includes the associated errors coming from α_s , PDFs and scale uncertainties, using the results of groups such as PDF4LHC. It will also make recommendations on the input parameters: top and bottom quark masses and the specific programs for interpreting them. There is, furthermore, a need to consider those states, such as WW or $\gamma\gamma$, where Higgs boson production can interfere with other processes. The group will make recommendations on how the cross-sections of background processes, luminosity errors and any common b-tag uncertainties should be handled.

Agreement on these issues will facilitate comparison and combination of results. This will require the active collaboration of the leading theorists developing the tools.

We therefore propose setting up a common group between ATLAS, CMS and the theoretical community, to discuss and recommend on these issues, producing numbers that both experiments can use. This is similar to, but distinct from, the statistics forum, although it is likely there will be many people common to both. This group should consist essentially of the experts from the two communities and theorists who are willing to help, but be open to anyone wishing to attend. We propose mandating one person from each experiment and the theoretical community to act as contacts and liaisons, ensuring that progress is made. It is crystal clear that unreleased data results from the collaborations will not be shown or discussed in this forum.

In addition it will be necessary to establish a repository for the software used to make the calculations, so that reliable version control can be

ensured. This will require a librarian drawn from the interested community. Software maintenance is not implied here.

We currently envisage having meetings 3 or 4 times per year, with reports to the experiments after each. Meeting agenda will be publicly available in the CERN Indico system, along with a mailing list. The common group should continue until one or both experiments feel it is no longer required.

In ATLAS the contact would be proposed by the Higgs conveners, ideally from the cross-section task force, with a proposed duration of two years. The contact will report progress to the ATLAS Higgs working group.

In CMS, the contact person would be proposed by the Higgs conveners and the physics coordinator, with a suggested duration of two years. The contact will report progress to the CMS Higgs working group.

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