International Masterclasses Steering Group

Approval of measurements

21.11.2013

International Masterclasses (IMC) are currently experiencing an expansion, not only in numbers of participating countries and institutes, but also with regard to measurements being made available for students participating in the program. To ensure the quality of the whole program the steering group (SG) has written a document describing the process of approval for measurements in International Masterclasses.

Preliminary remarks:

1. International Masterclasses are organized each year, preferentially around March, in a period between Carnival/Shrovetide and Easter.
2. International Masterclasses address high school students, aged 15 – 19.
3. Students come to research labs for one single day, often without any preknowledge of particle physics.
4. All Masterclasses follow a typical agenda, which can be found here: www.physicsmasterclasses.org/index.php?cat=local_organisation&page=orga_intro
    a. In the morning students listen to introductory lectures.
    b. Additional visits, lab tours, or Q&A sessions are optional.
    c. After lunch they have about 2 hours related to the measurement, where students work in pairs on PCs.
    d. These 120 min split up into:
        i. 30 min introduction to the measurement
        ii. 75 min measurement
        iii. 15 min discussion of results
    e. A video conference with CERN (4 - 5 pm CET) or Fermilab (appropriate time) is arranged. Participants are 3 - 5 institutes that performed the same measurements (on different data sets) and 2 moderators. Results (e.g. mass plots, histograms, tables) are presented, combined and discussed, followed by Q&A and a quiz.

Guideline for measurements in IMC:

1. The basic idea of the measurements is a question related to particle physics. The outcome of the measurements leads students to new and fundamental insights in this field.
2. Measurements include event displays or at least start with a visual analysis.
3. All tools and programs used by the students have to be adapted to high school students´ needs.
4. As far as possible students should be able to follow the processing of results, black boxes should be avoided.
5. All tools and programs used by the students have to run on PCs with Windows or Linux (webbrowser, java, …) everywhere.
6. Results obtained by students have to be presented in a graphical way (histograms, tables, …).
7. Experiments have to provide real data (MC only for e.g. discovery tasks).

Procedure:

1. The steering group approves every new measurement, and measurements that undergo major modification or extension.

2. Pilot tests with student groups under the conditions of a Masterclass are mandatory before including a new measurement in the program. Pilot tests need to be completed by Oct 15.
3. An evaluation of the pilot tests with report on success and problems has to be presented to the steering group before Oct 31.
4. Each measurement has to provide a package with program and datasets for the IMC website before Jan 15. If translations by IPPOG members are requested the deadline is Nov 15.
5. Guidelines for local organizers and material for moderators have to be provided by Jan 31.
6. Deadlines have to be respected.
7. Measurements not meeting the deadlines or without sufficient maintenance can be excluded from IMC.