International Masterclasses
Videoconference

Manual

for

Local Organizers

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Introductory Remarks

This manual is the result of a working group set up at the 1st IPPOG Meeting in Košice, consisting of two experienced video conference moderators (Kate Shaw, Michael Hauschild), Uta Bilow, responsible for coordination of the International Masterclasses, and Laurenz Widhalm[†] as head of the group.

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Based on feedback collected over the years from students, teachers, moderators and (local and global) organizers, we defined the aims and structure of the video conference, and compiled a list of do's and don't's to achieve the best possible video conference experience for the students.

Please read this manual carefully to be optimally prepared for your Masterclass video conference!

Abbreviations used in this manual:

VC   refers to the Masterclass video conference

Symbols used in this manual:

Mandatory or strongly advised!

Avoid this!

[†] This manual is dedicated to the memory of Laurenz Widhalm, who initiated the Masterclasses Video Conference WG, and died after long illness on December 24, 2012.
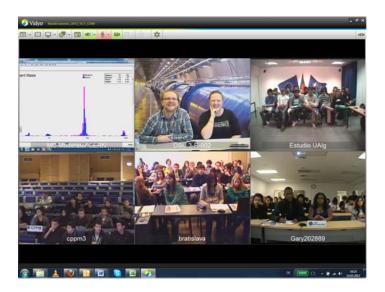
Contents

1. The Aim of the Video Conference

At the end of each day of International Masterclasses students will participate in an international video conference - together with up to four other institutes, according to the schedule, and moderators from CERN. The video conference will be held from 4 pm to 5 pm CET. Students report their results and combine them with participants from other countries. In addition, the video conference includes discussion of results with the moderators, a Q & A session, and a quiz.

The VC has to:

- convey the internationality of the event
- demonstrate how physicists work together internationally
- be a platform where students exchange
- demonstrate improvement in accuracy by combination of different data sets
- most importantly: BE FUN FOR THE STUDENTS!

it is NOT supposed to:

- deepen the understanding of the physics
  (better done locally in the native language)
- teach English vocabulary of particle physicists
  (vocabulary should not distract from physics)
- contain a basic discussion of the measurement
  (has to be done locally before)
- create a competition regarding the measurements
  („who is the best?")
- have local physicists talking instead of students

2. Integration in the Local Event

Based on frequent feedback we received, and from our experience, we set the following limits for the VC as part of a local Masterclass event:

The VC has to start at <u>4:00 pm sharp !</u>

In order to achieve that, the **local part has to be finished early enough** (proposal: limit talks to 2 x 45' covering physics and detectors, respectively)
The (minimal set of) topics covered by local talks is defined (see annex, part a), so that moderators know what they can expect.
Time zone problems have to be solved individually.

Strict time limit of 60 Minutes!

While there are always a few students that cannot get enough, feedback tells us that the majority is too exhausted at the end of a long day for a longer VC; the VC should be the closing highlight of the day, not remembered as the one thing that just would not end!

Limit of 5 participating institutes!

From experience we know that otherwise technical difficulties, which never can be avoided completely, tend to spoil the VC experience. If there are more than 5 Masterclasses on a specific day, then parallel VCs will be organized (few exceptions). This means, that Masterclasses have to pay attention to connect to the correct VC.

3. Presentation of the Video Conference
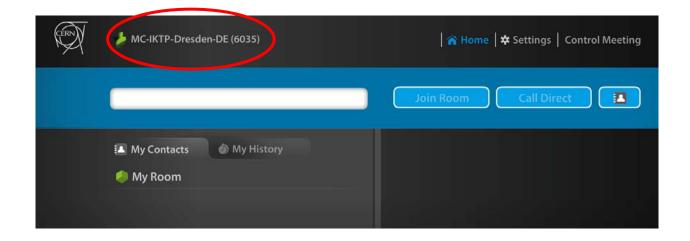
Convey your location!

⚠️ Display a card board sign in front of your students showing your site´s name.

⚠️ Your Vidyo Name will always be in the form MC-Institute-City-Country.

4. Elements of the Video Conference

a) Overview & Timing

Welcome & Icebreaker _____ 10'
Report of Measurements _____ 15'
Combination & Discussion of Measurement _____ 10'
Open Discussion _____ 14'
Quiz _____ 10'
Good Bye _____ 01'

b) Welcome & Icebreaker

⚠️ **The welcome has to be on schedule, common and interactive!** It has to immediately establish the fact that there is a two-way connection between students and the moderators, and that students can and should actively take part in the VC, and not just listen to the moderators.

- Select **speakers (students)** for your Masterclass already before the VC
- **Connect in time (at least 10 min before the VC starts)!** Sound check must be done before VC starts
- Define **extra person** responsible for setting up VC
- **Stay muted** unless addressed by the moderators
- Moderators will ask each Masterclass one short question and let them speak (If you have an idea for a localized question, please submit it to the moderators beforehand, e.g. the Masterclass in Vienna could be asked whether they have seen the VERA accelerator)

Moderators will display a **map** showing all connecting sites
Example for March 7, ATLAS Z-path:

c) Report of Measurements

The reports of results are **given by the students**!

- select speakers already before the VC starts! Speakers should be given instructions and hints for the report – it should include: results, uncertainties, difficulties they had, questions that arose, … (they should talk about that themselves, instead of having the moderators repeating the same questions again and again!)

- students should always mention their name and city first when speaking

- each report is limited to 2 minutes!

- all reports are given in a row, not interrupted by questions or comments (neither from moderator nor students)

- afterwards, students have a chance to comment / ask questions

d) Combination & Discussion of Measurements

After collection of the results and the immediate discussion, the moderators combine the results, summarize and comment.

Afterwards, there is another opportunity for the students to comment/ask

e) Open Discussion

After the specific discussion of measurement, the discussion can expand to more open and general questions.

The **students should be prepared** by local organizers, in order to have some questions ready.

f) Quiz

The quiz has the following concept:

bounding conditions:

- multiple choice questions (4 answers)
- everybody involved (plays on his/her own)
- correct answer will be revealed immediately after each question
- scoring done by each student him/herself
- answer sheets should be distributed before the VC starts
- no public comparison of scoring
- no prizes, just for fun

Moderators will present the English version via video stream. Local language versions are available for download and can be shown locally in parallel (prepare second set of PC and beamer).

Detailled instructions for the quiz can be found in the annex, part d (p. 17).

g) Common Good Bye

There has to be a clear, common end of the VC after 60 minutes!

What happened in the past and has to be completely avoided is Masterclasses quitting the VC one after the other (because of local time constraints, or because of the VC getting over time), with no clear end of the VC.

Also in case of very lively discussions, the moderators still have to officially end the VC in time. They can, however, offer to stay online after the official end. But this is completely on a voluntary basis. Alternatively, students can be offered to continue the discussion locally with the local experts.

ANNEX

a) List of Topics for Introductory Talks

We recommend to plan two talks (45 min each), which should cover the following topics:

1. Motivation
- Basic understanding of the world (philosophy / connection to cosmology: dark matter, Big Bang, formation of elements…)
- Applications: medicine, material research, …
- Fun facts, anecdotes
- Current research topics in high energy particle physics: Higgs, dark matter, antimatter

2. Standard Model
- elementary particles (2 groups: quarks, leptons, 3 generations)
- forces
- charges

3. Accelerators
- acceleration in electric fields
- magnets
- LHC/CERN: status and aims
- collisions: $E=mc^2$, new particles are created in collisions, conversion of energy to mass

4. Detectors
- Basic types of detectors
- Typical structure of a detector
- Charged particles: curvature in magnetic fields
- Absorption of energy and transformation into electrical signals
- basic principles how particles are identified: via their pattern in detectors

5. Data Analysis
- concept of signal and background
- methods of discovery of new phenomena (counting methods, mass peaks, etc.)
- statistics and error estimation

6. Organisation and methods of research
- international collaborations

b) Hardware Recommendations

PC:

- Intel Dual Core or Dual 2 Core, 2Gb RAM with Windows XP/Vista/7 (recommended) or selected Linuxes (SLC 5.5 or Ubuntu 10.01),
- Recent graphic card
- Macintosh (recommended) with Intel processor with 1Gb RAM with Mac OSX 10.5 or later

Video:

- Logitech Quickcam pro 9000 (~ 100 €) or other USB camera

Audio:

Echo cancelling device is strictly required

- You can get echo cancelling device from Phoenix company: http://www.phnxaudio.com
- Or from CERN stores:https://edh.cern.ch/edhcat/Browser?command=showPage&argument=264420&top=264420&objid=$$EDH5j485opgg&showAdvanced=&scem=&keywords
- You can also get a Jabra device:http://www.jabra.com/na-us/headsetsolutions/pages/speakerphones.aspx

c) Room setup

Office (1 - 2 person):
1 PC + camera + Headphones or Speakerphone (~ 200 €)

Small conference room (10 people):
1 PC + camera + Phoenix Solo (~ 150 €), external speakers needed,
or Phoenix Quattro (~ 500 €), external speakers optional
1 PC + H.323 device like Tandberg or Polycom (starting at 8.000 €)

Large conference room (10 - 30 people):
1 PC + camera + Phoenix Quattro (~ 500 €)
1 PC + H.323 device like Tandberg or Polycom (starting at 8.000 €)

Auditorium:
1 PC + H.323 device like Tandberg or Polycom (starting at 8.000 €)
1 PC + Phoenix Solo (~ 150 €) or Phoenix Quattro (~ 500 €)
1 PC + Phoenix SOHO card (PCI card to Desktop PC)

We advise to use the first option. If it's not possible (too expensive) you will have to get the echo canceller device Solo or Quattro. Connect this device with USB to PC, and the speakers of the room connect to the echo canceller.

We strongly recommend to test and tune the setup before the Masterclass. All tests should be performed with exactly the same equipment and in exactly the same room as the real event.

Furthermore, we recommend using a second set of PC and beamer, without transmission of audio, to display the results of the combination or questions during the quiz.

d) Vidyo

The video linkup is via Vidyo

Vidyo entrance and documentation
http://www.cern.ch/vidyo
http://www.vidyo.com/knowledge-center/
http://vidyoportal.cern.ch/

Meeting rooms
The VC´s will be held in the following venues (accessible directly via the web link).

Masterclasses 2013 VC1:
https://vidyoportal.cern.ch/flex.html?roomdirect.html&key=tvdZ8uKKtQJc

Masterclasses 2013 VC2:
https://vidyoportal.cern.ch/flex.html?roomdirect.html&key=ye8a5NXdyHJM

The correct Vidyo room for your Masterclass can be seen from the schedule:
http://physicsmasterclasses.org/neu/index.php?cat=schedule

Vidyo Tests
A Vidyo test session period (~ 4 weeks before Masterclasses begin) will be conducted. The tests have to be performed by all new participants and by those with new equipment or rooms. All tests should be performed with exactly the same equipment and in exactly the same room as the real event.

Vidyo client users guide
http://www.vidyo.com/knowledge-center/
   → Best Practices for Voice & Video (optimal setup, troubleshooting)

To use of an H.323 system with Vidyo:
http://service-vidyo.web.cern.ch/node/17

Firewall configuration for Vidyo clients:
http://service-vidyo.web.cern.ch/node/21

Vidyo frequently asked questions:
https://cern.service-now.com/service-portal/faq.do?name=vidyo

A tutorial on Vidyo from the CERN Training catalogue:
https://indico.cern.ch/conferenceDisplay.py?confId=173834

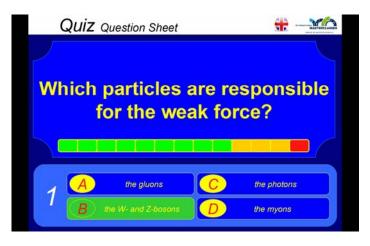**Vidyo support**
vidyo-support@cern.ch

e) Instructions for the Quiz

⚠️ The purpose of the quiz is to have a highlight at the end of the video conference, and to get everybody involved. It also helps to have a clear, common end of the video conference after the open discussion*

Concept of the quiz:

- the presentation is based on the TV-show "Who wants to be a millionaire?"
- there are 7 multiple choice questions (4 answers) of increasing difficulty
- everybody plays on his/her own
- the correct answer is revealed immediately after each question
- scoring is done by each student him/herself (answer sheet is provided, see below)
- the measure for the score is eV (electron volts); for each correct answer the student increases his/her energy level, the top level is 7 TeV
- as in the TV-show, reaching top score will be very hard
- there is no public comparison of the scoring
- there are no prizes to win, the quiz is just for fun

* It is better to tell the students to end the discussion because it is time for the quiz instead of just cutting the discussion off and saying good bye.
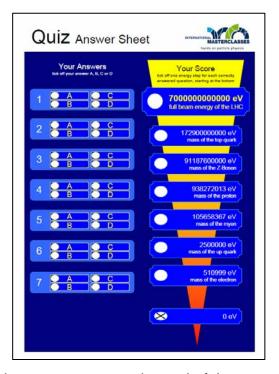
Material for the quiz:

the following material is available for download in the IPPOG database:
https://cms-docdb.cern.ch/cgi-bin/PublicEPPOGDocDB/ShowDocument?docid=305
and
https://cms-docdb.cern.ch/cgi-bin/PublicEPPOGDocDB/ShowDocument?docid=308

- an **answer sheet** (pdf) to be filled out by the students (to be printed and distributed by the *local organizers*; there are two versions in color and b/w)
- a **.ppt file** with the questions translated in the **local language** (to be optionally shown locally in parallel with the moderator's ppt); this file only contains questions and multiple choice answers, no timer, no solutions. Not all languages available!
- **English animated version** (to be shown by the *moderators* at CERN via Vidyo)

Procedure of the quiz:

- 10' before the end of the VC (latest!) moderators announce the end of the discussion and start of the quiz
- local organizers distribute the answer sheets to the students
- moderators start the animated .ppt and explain the rules
- each question and the 4 answers are read aloud by the moderators; optionally, local organizers show the translated question in parallel

- moderators start the timer, students have to tick off their answer on their answer sheet within this time
- moderators reveal the correct answer, and **shortly** explain why this is correct
- all students that got the answer right may now tick of their next energy level on the answer sheet
- now proceed to the next question…
- after the last question and explanation of the correct answer, moderators say something like: "I hope you all had fun with the quiz – and the whole video conference. Now time is up…"