



International Masterclasses Videoconference

Manual for **Moderators**

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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.

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 dos and don'ts 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!



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About International Masterclasses

International Masterclasses provide a unique opportunity for High school students to be "scientists for a day". 16- to 19-year-old students in 31 countries around the whole world are invited to one of about 120 nearby universities or research centres for one day in order to take part in an authentic research process. They hear lectures from active scientists and gain insight into topics and methods of basic research into the fundamentals of matter and the forces. Thus prepared, students perform measurements themselves on real data from particle physics experiments at the LHC (ALICE, ATLAS, CMS). At the end of each day, as in an international research collaboration, the participants join in a video conference for discussion and combination of their results. In summary, International Masterclasses offers students the chance to close their textbooks and experience modern science first-hand.

The International Masterclasses are a core activity of IPPOG, the International Particle Physics Outreach Group. The program is organized and run by Michael Kobel of the Technical University Dresden, Germany, and coordinated by Uta Bilow from TU Dresden.

Particle Physics Masterclasses began in 1997 in the United Kingdom. The European program started in 2005, the World Year of Physics, and has grown constantly since then. In 2006 American students participated for the first time in a parallel program organized by QuarkNet, and since then more and more countries have joined in.

With its unique approach the International Masterclasses cover various aims:

- link school and research institutions
- bridge the gap between science education at school and modern scientific research
- stimulate interest in science
- improve understanding in science and scientific research
- demonstrate the scientific research process
- provide an attractive opportunity to get a first glimpse of modern physics research

Int. Masterclasses: www.physicsmasterclasses.org

IPPOG: <http://ippog.web.cern.ch/ippog/>

QuarkNet: <http://quarknet.fnal.gov/>



The Aim of the Video Conference

The VC has to:

- **convey the internationality of the event**
- **demonstrate how physicists work together internationally**
- **encourage students to exchange experiences between masterclasses**
- **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?")



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 4:00 pm sharp, 30 minutes earlier than the usual time in 2011!

Before 2012, VCs started 4:30 pm and often ended more than one hour later close to 6 pm. As a consequence, students were getting tired after a long day, and/or left the VC before the official end.



Strict time limit of 60 minutes!

While there are always a few students that cannot get enough, feedback tells us that the majority are 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!

If there are more than 4 masterclasses on a specific day, then **two parallel VCs** will be organized (**VC1, VC2**).



Moderators have to pay attention to go to the right VC location and connect to the correct VC!

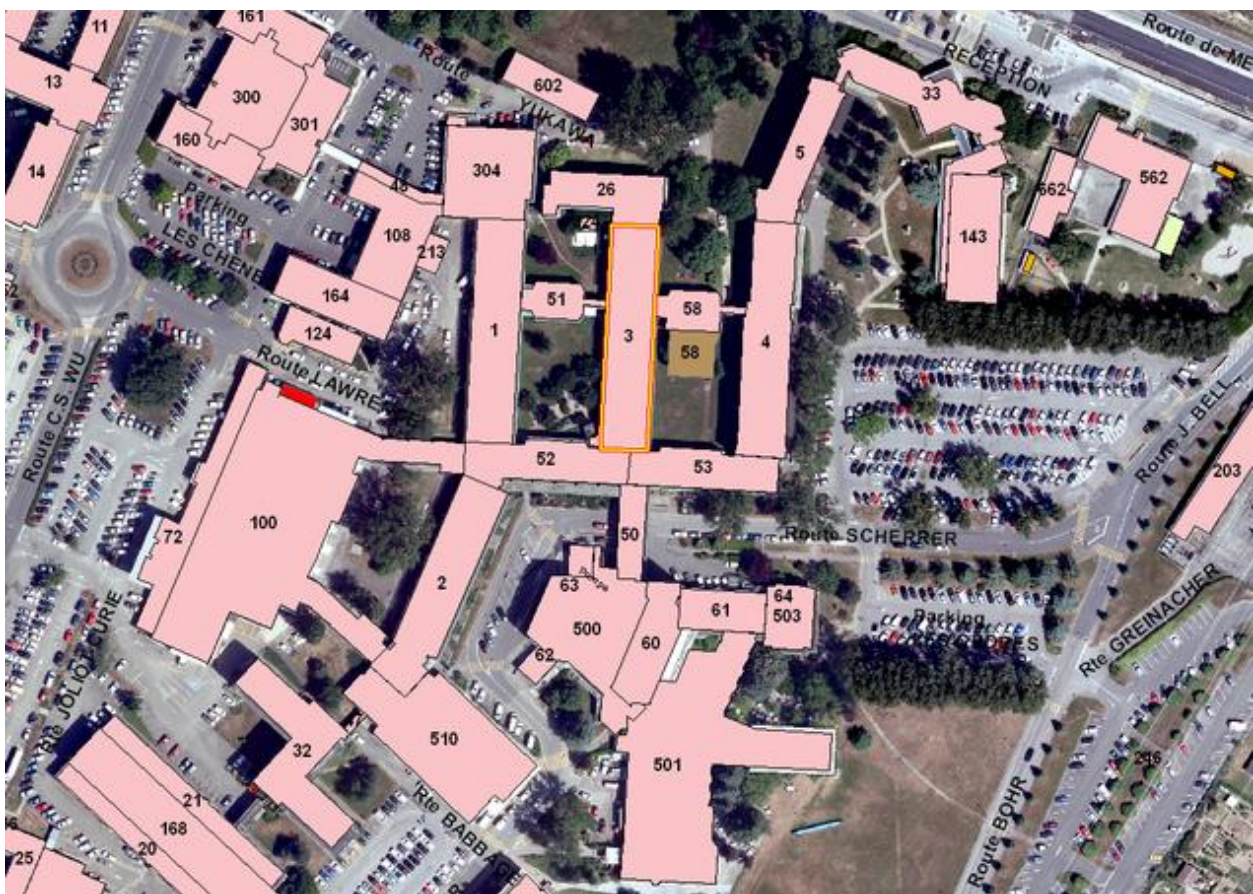
The two VC rooms are at different locations at CERN, not close to each other. If it happens that you went to the wrong VC, you might need 10-15 minutes to move to the right VC. The correct VC can be seen from the schedule:



<http://physicsmasterclasses.org/neu/index.php?cat=schedule>

Locations of the Video Conferences at CERN (I)

VC1: Teachers Lab (building 3-R-002)



VC1 is held in the Teachers Lab (building 3-R-002), close to the CERN main building.

Keys can be obtained from the following people, their office (3-R-006) is just next door of the Teachers Lab:

- [Konrad Jende](#): +41 22 767 1395 (71395 internal), +41 76 487 0246 (mobile, 16 0246 internal)
- [Martin Hawner](#): +41 22 767 1395 (71395 internal), +41 76



487 8956 (mobile, 16 8956 internal)

On weekends, or in case you don't find any of the above people the **key is usually deposited in an open cupboard** next to the door of the Teachers Lab:



VC 1 moderators are typically sitting in front of a large photo with a view of the LHC tunnel and magnets.



This sometimes gives the impression that moderators are **REALLY** sitting in the LHC tunnel. You may expect questions about that.

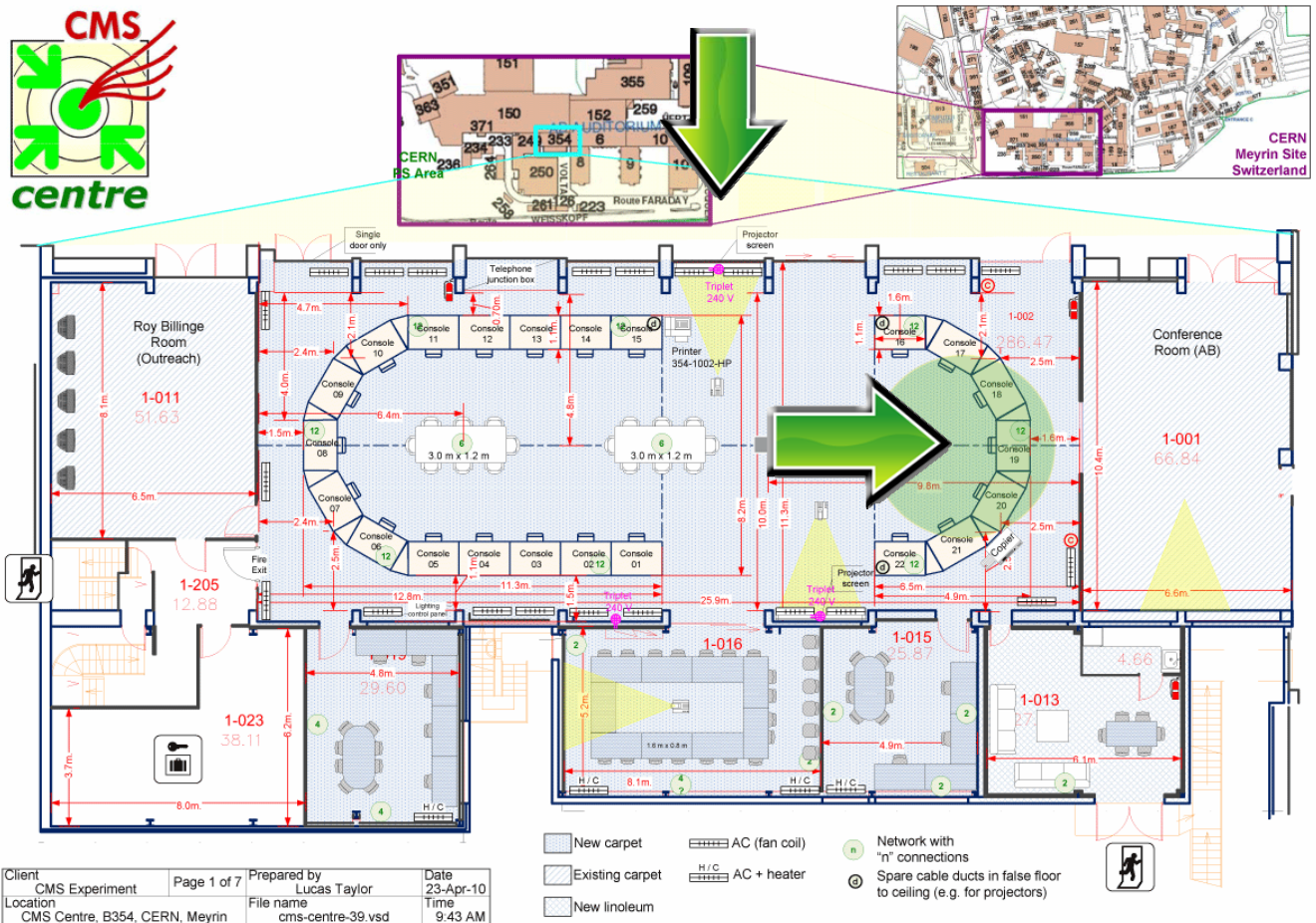
VC1-PC: pcvc33.cern.ch



(presently 137.138.201.149, but IP address may change)

Locations of the Video Conferences at CERN (II)

VC2: CMS Centre (building [354-1-002](#), first floor)



In case of 2 parallel VCs, **VC2 will be held in the main room of the CMS Centre**, in the smaller of the two arcs of computers. The **green circle** in the plan shows the location. There are usually one or two shifters in this arc, but they can possibly move to the other end for the duration of the conference.



The idea of the VC is to give the students in the institutes an insight into life at CERN, and this includes showing them physicists working right behind the conference moderators!

If you're unfamiliar with the location, please feel encouraged to pass by the CMS Centre a day before, to check the room, how to switch on the PC, and connect to EVO.

Access to the CMS Centre is restricted and requires specific access rights. For entry you can contact the following people:

- [Marzena Lapka](#): +41 22 767 2484 (72484 internal), +41 76 487 2346 (mobile, 16 2346 internal)
- [Achintya Rao](#): (room 354-1-15 inside the CMS Centre), phone +41 22 767 1073 (71073 internal)
- or you wait in front of the door until a CMS person lets you in

VC2-PC: vccmscentre02.cern.ch
(presently 137.138.72.240, but IP address may change)



Before the Video Conference

Arrive at the correct VC location at least 30 minutes before start of the conference.

- There are **sometimes trivial problems** which may keep you busy, e.g. empty batteries of the remote controls for screens, PC start-up problems etc.
- You need to **foresee enough time** to solve these problems before the VC official start.

Check the availability of live video streams from the ALICE or ATLAS Control Rooms

- **Live video streams** from the Control Rooms are supposed to be shown during the introduction. They **are booked by the Masterclasses organizers** for the time of the VCs. Video streams are **not publically accessible** and can only be seen on the VC1- and VC2-PCs.
- Open a browser and **check if video streams are available**.
ALICE video stream:

<http://alice-logbook.cern.ch/pr/cam03.jpg>

<http://alice-logbook.cern.ch/pr/cam04.jpg>

<http://alice-logbook.cern.ch/pr/cam05.jpg>

<http://alice-logbook.cern.ch/pr/cam07.jpg>

ATLAS video stream:

<https://espace.cern.ch/atlas-collaborative-tools/atlas-live/acr-hdtv/default.aspx>

- **In case of problems** with the video streams, you may still **show pictures from webcams instead**, which are publically available at any time:

ALICE webcams :

Link to be added



ATLAS webcams (detector views in underground cavern):

<http://www.atlas.ch/webcams.html>

CMS webcams (control room and outside view):

<http://cern.ch/cmsinfo/Media/CMSEye/index.html>



Make yourself familiar with the correct pronunciation of the names of the participating institutes

- It's sometimes challenging to correctly pronounce some names. If in doubt, just call them by their country.

Check the communication with the participants one-by-one before the official start of the VC

- say "Hello", ask if they can hear us and can see us in ... ask if they could wave their hands...



In case of communication problems with one or more participants or missing participants

- do not wait a long time until they have solved their problems
- start the VC on-time, give a maximum of 2 minutes to participants in case there is hope that they might solve their problems
- pay attention to participants that are obviously connected to the wrong video conference, urge them to change the meeting room

Prepare/upload all material you will need

- live stream from control room
- map
- table/website for combination of results
- animated quiz



Basic Communication Issues

There are (mostly) **two moderators** running the show

- both moderators should talk roughly equal amounts
 - in case of a (more) senior + (more) young moderator, the senior one should not answer all questions
- **avoid talking too much to your co-moderator**
 - a long dialog only between the moderators may disconnect the students
- if you feel you've talked too much, **hand over to your co-moderator**, e.g. “Uta, this seems a perfect question to be answered by you...”

Most of the students are not native English speakers and don't understand and speak English very well

- speak slowly and clear
- avoid using complicated and long sentences
- use simple words (vocabulary of the students is limited)
- don't use acronyms, abbreviations, physics slang not common outside of our community, avoid talking “CERNish”

Keep explanations short

- don't try to explain the LHC in 5-minutes...



Elements of the Video Conference

Overview & Timing

- Welcome & Icebreaker _____ 10' (16:00 – 16:10)
- Report of Measurements _____ 15' (16:10 – 16:25)
- Combination & Discussion of Measurement ___ 10' (16:25 – 16:35)
- Open Discussion _____ 14' (16:35 – 16:49)
- Quiz _____ 10' (16:49 – 16:59)
- Good Bye _____ 01' (16:59 – 17:00)



Welcome & Icebreaker (10')



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.

Introduce yourself

- e.g. “My name is Michael, I'm working at ..., one of the 4 large experiments at the LHC collider at CERN in Geneva Switzerland...”

Explain where we are (the moderators)

- e.g. “Right now we are sitting at CERN. CERN is the largest centre for particle physics research in the world and a rather cool place...”

Put live video streams from the ALICE, ATLAS or CMS Control Rooms onto the shared desktop

- explain what can be seen, e.g. physicists from ALICE/ATLAS/CMS are doing shifts on 24h/7d basis in their control rooms to monitor the detectors (high voltage, gas, cooling etc.). LHC will start running within the next days/weeks to continue data taking for discovery of the Higgs...

Tell in a few words, what's happening in the next hour

- read the agenda, e.g. report of measurements and discussion of the results, questions to the moderators, quiz



Display a map showing all connecting sites

- an actual map of today's VC is available, produced by the Masterclasses organizers before the VC:

<https://twiki.cern.ch/twiki/bin/view/Main/InternationalMasterclassesModeratorManual>

example for March 7, ATLAS Z-path:



Ask one short question to each masterclass

- address each masterclass individually, one by one
- the **answer** should be given **by a student** (not the organizers or teachers), **no longer than 2 minutes**.
- the question **could be a localized question**, that you might have received from the local organizers beforehand, e.g. "Vienna, have you seen the VERA accelerator?"

in case of no localized questions, you might try some general questions, e.g. was it difficult to follow the lectures, have you heard from CERN / the LHC before (more ideas for welcome questions on

<https://twiki.cern.ch/twiki/bin/view/Main/InternationalMasterclassesModeratorManual>



Report of Measurements (15')



The reports of results are given by students!

Put up the results page onto the shared desktop and address each masterclass individually, one by one.

- ALICE: <http://www.editgrid.com/user/alice-masterclass/results-2012-example.csv>
login: alice-masterclass, password: alice
- ATLAS Z-path: <http://cernmasterclass.uio.no>
username : ippog, password: mc12
- ATLAS W-path: combination:
http://www.editgrid.com/user/masterclass/Analysis_2012
histogram: www.cern.ch/kjende/en/wpath_auswertung.htm
- CMS:
http://quarknet.us/library/index.php/CMS_Combination_of_Results_2012 (scroll to the "Moderators Level" under "W/Z Measurement")
- Students should report on **results**, **uncertainties**, **difficulties** they had, **questions** that arose, etc.
(they should talk about that themselves, instead of having the moderators repeating the same questions again and again!)



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



Combination & Discussion of Measurements (10')

After the collection of the results and the immediate discussion, **the moderators combine the results** (all masterclasses in a given VC will do the same measurement*, but will have different data), **summarize** and **comment**.

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

* combination of similar measurements from different experiments is possible in future, (e.g. W-path for CMS and ATLAS)



Open Discussion (14')

After the specific discussion of the 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.

Questions can be on anything, not only related to physics

- life at CERN, how many people, what are you doing
- LHC, size, magnets, costs, power consumption
- Detectors, size, how do they work
- Experiments, how many people in ALICE/ATLAS/CMS
- Universe, big bang, dark matter
- How to I (the student) can come/visit to CERN

Try to give short answers, to allow more students to ask questions.



Quiz (10')

A new concept for the quiz has been developed.

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

Detailed instructions for the quiz can be found in the annex.



Common Good Bye (01')



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 the 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

Part a

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 2012 VC1:

<https://vidyoportal.cern.ch/flex.html?roomdirect.html&key=tvdZ8uKKtQJc>

Masterclasses 2012 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>

Login

Access the meeting link (described above) and enter the credentials that correspond to the CERN moderators:

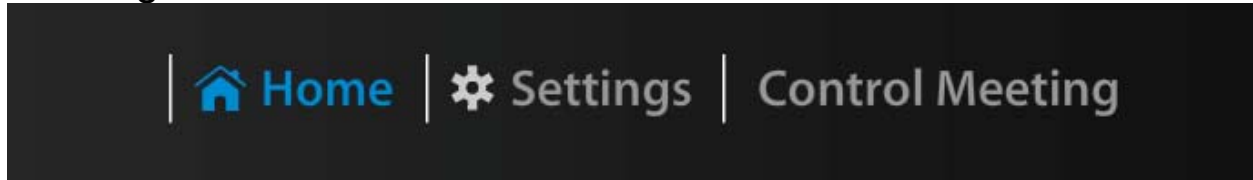
VC1: mcmod1 / mcmod1

VC2: mcmod2 / mcmod2

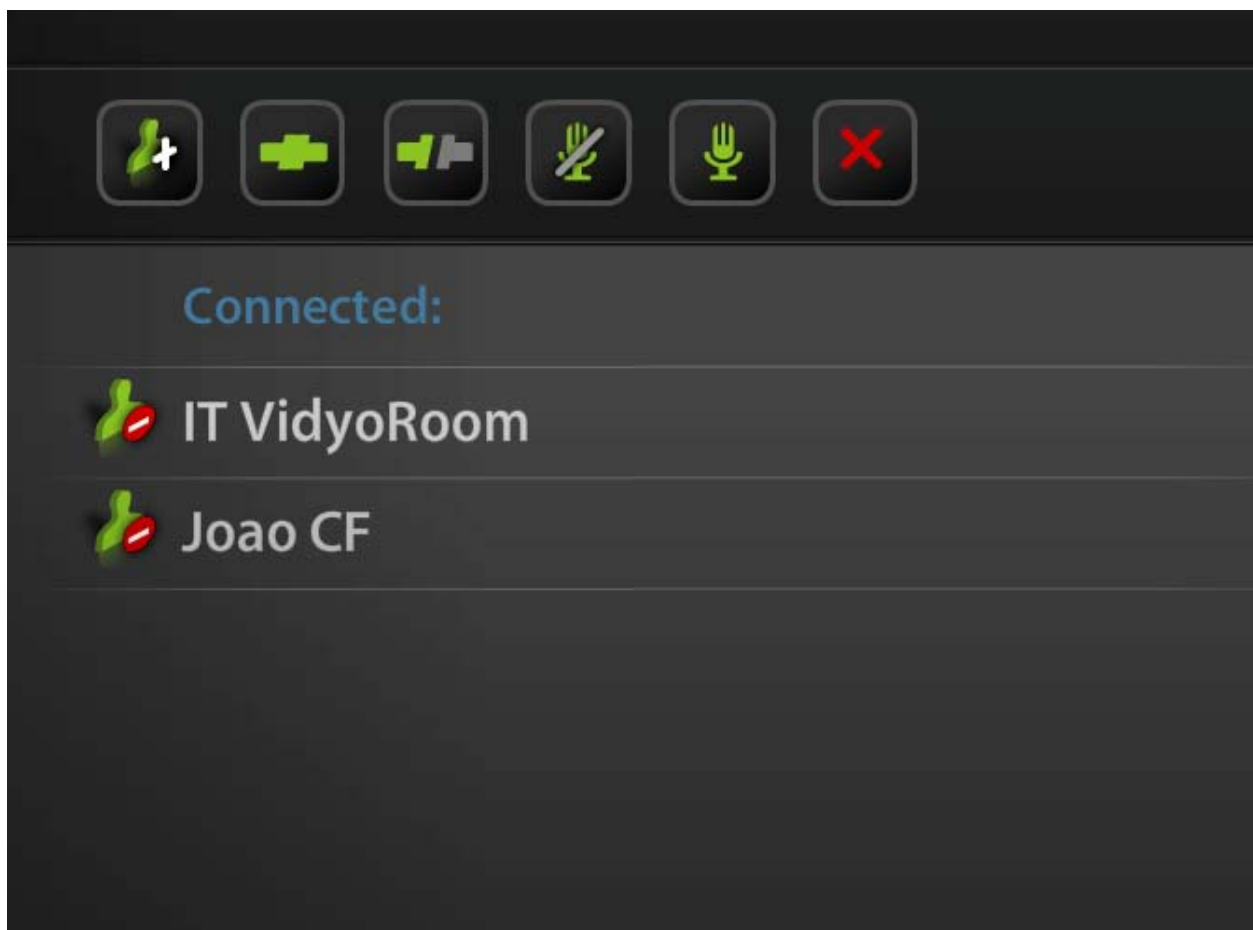


Important features:

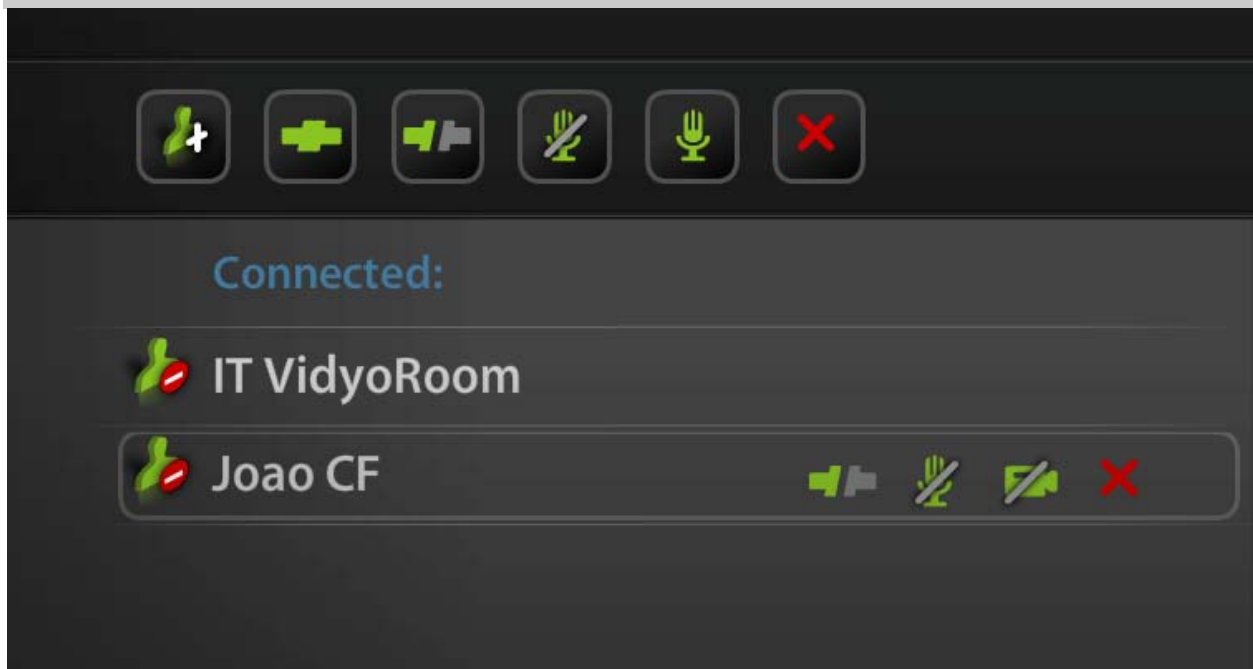
Mute participants that cause noise! To do this, go to control meeting:



and see the active list of participants.



Selecting a participant, a button for mute audio, video and kick off will show.



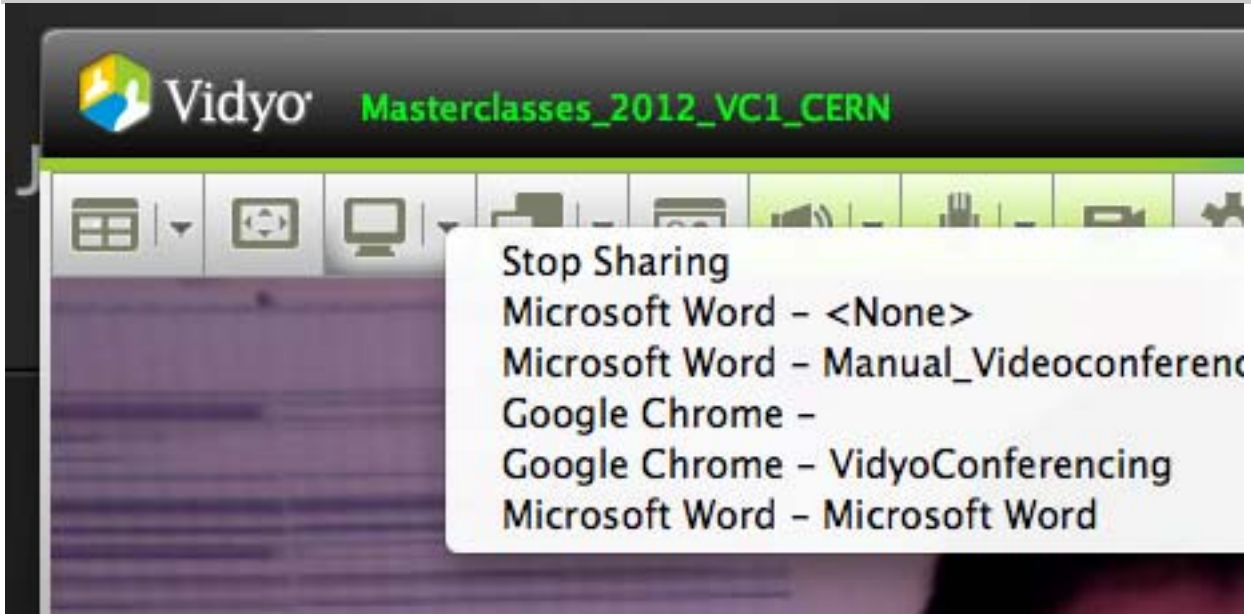
NOTE: the VidyoDesktop client will be launched on the room VC PC, but since the communication is done via the H323 terminal installed in the room, one needs to mute immediately the desktop client (6th and 7th buttons on the interface:



with the speaker and mic icons) to avoid any echoes.

Desktop Sharing

To share the Desktop from the VC PC, one needs to click on the 3rd button of the VidyoDesktop interface and select the application one wants to share:



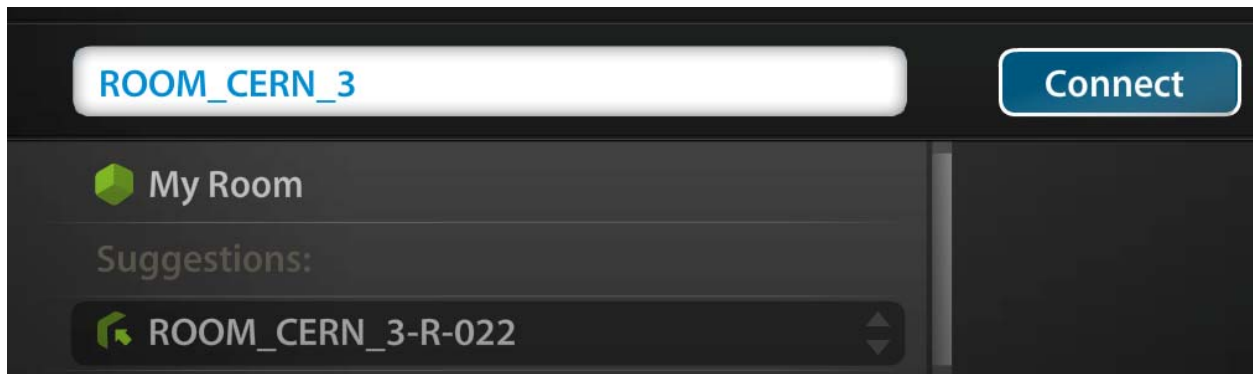
Connection of the CERN physical room

The connection of the physical room can be done in the same interface to mute participants, by clicking on add participant and typing ROOM_CERN_name_of_the_room:





One needs to select the room and click on Connect



Vidyo Tests

A Vidyo test session period (~ 4 weeks before masterclasses begin) will be conducted. The tests have to be performed by all participants. 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/>

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

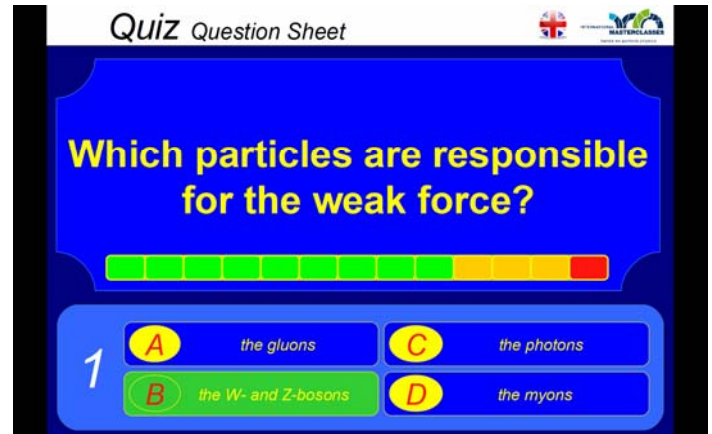


Part b

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.

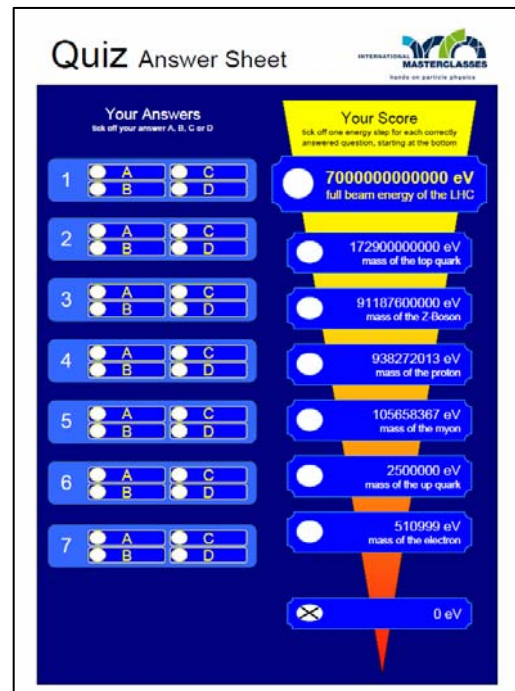


material for the quiz:

the following material is available for download in the TWiki
(<https://twiki.cern.ch/twiki/bin/view/Main/InternationalMasterclassesModeratorManual>)

or in the IPPOG database: <https://cms-docdb.cern.ch/cgi-bin/PublicEPPOGDocDB/ShowDocument?docid=305>

- **English animated version**, including timer and answers (to be shown by the *moderators* via Vidyo)
- 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 by the *local organizers* in parallel with the moderator's ppt); this file only contains questions, no timer, no answers



Quiz Answer Sheet

INTERNATIONAL MASTERCLASSES
hands on particle physics

Your Answers	Your Score
<small>tick off your answer A, B, C or D</small>	<small>tick off one energy slot for each correctly answered question, starting at the bottom</small>
1 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 7000000000000 eV full beam energy of the LHC
2 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 172900000000 eV mass of the top quark
3 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 91187600000 eV mass of the Z boson
4 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 938272013 eV mass of the proton
5 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 105658367 eV mass of the muon
6 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 2500000 eV mass of the up quark
7 <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D	<input type="checkbox"/> 510999 eV mass of the electron
	<input type="checkbox"/> 0 eV

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
- in parallel, the moderators start the animated .ppt and explain the rules (do not stop transmitting your own vidyo)
- 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 **briefly** explain why this is correct
- all students that got the answer right may now tick off 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...”



moderators: do not start a lengthy discussion about the quiz answers – if any questions are open, they should be answered locally