

# INTERNATIONAL MASTERCLASSES HANDS ON PARTICLE PHYSICS



Institut "Jožef Stefan"



Univerza v Ljubljani

Fakulteta za *matematiko in fiziko*

Oddelek za fiziko



hands on particle physics



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**INTERNATIONAL  
MASTERCLASSES  
HANDS  
ON PARTICLE  
PHYSICS**



# Belle II International Masterclass

**3.3.2021 od 9h do 17h**  
**po video povezavi**

Izr. prof. dr. Rok Pestotnik

Institut "Jožef Stefan", Ljubljana

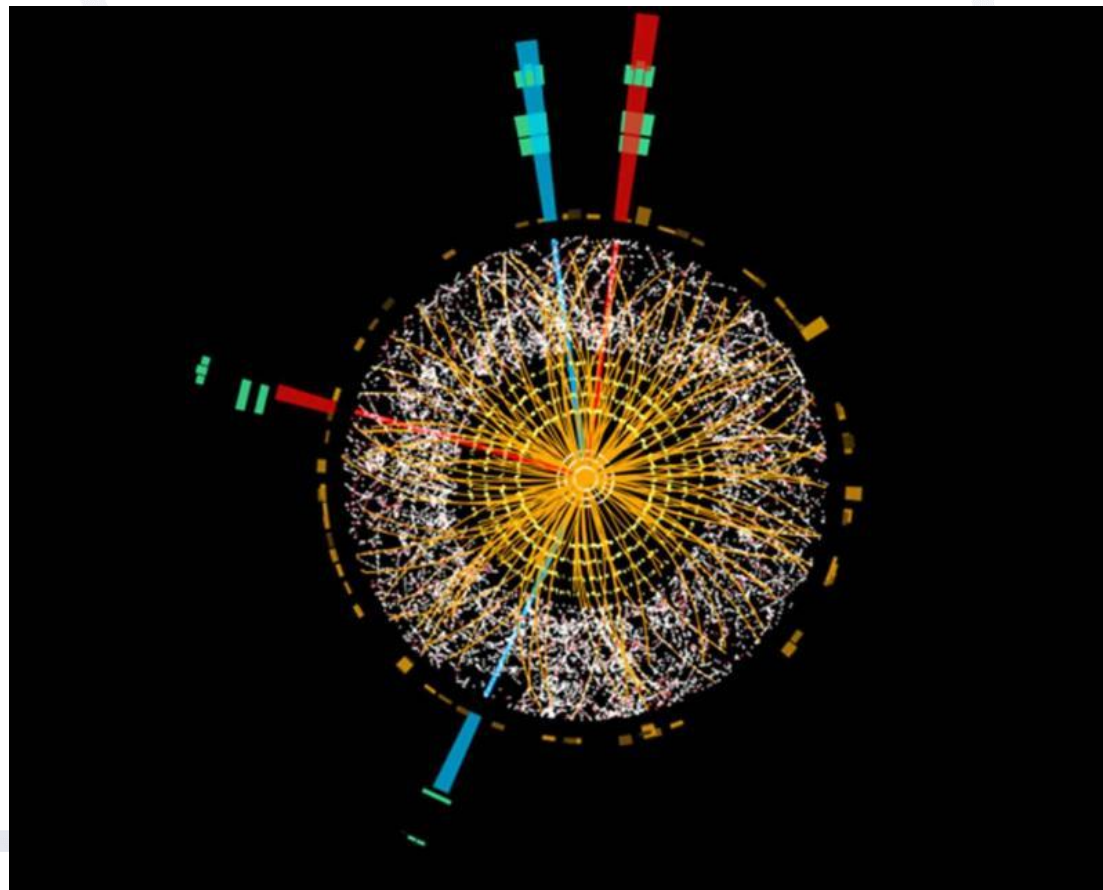
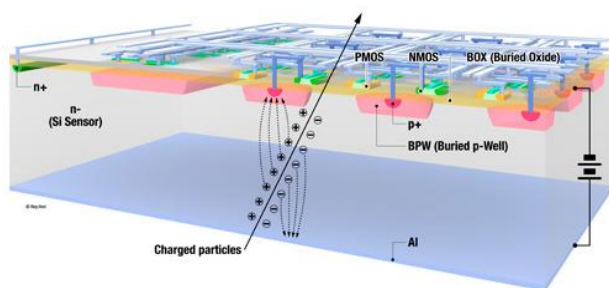
Odsek za eksperimentalno fiziko osnovnih delcev

# Program

<https://indico.ijs.si/event/1189/timetable/#20210303>

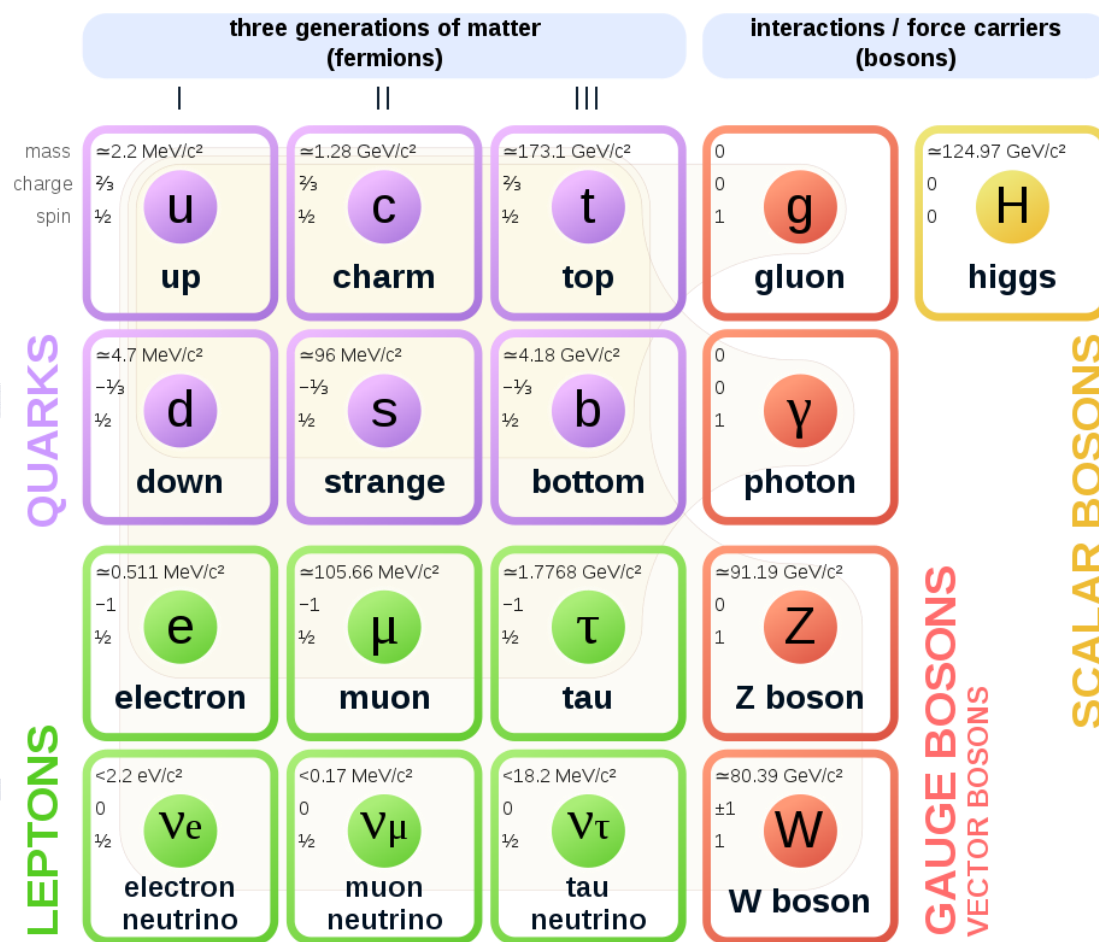
|               |                                                                        |                                                         |
|---------------|------------------------------------------------------------------------|---------------------------------------------------------|
| 9:00 - 9:15   | Pozdravni nagovor                                                      | Izr. prof. dr. Rok Pestotnik, IJS                       |
| 9:15 - 10:00  | Eksperimentalne metode v fiziki osnovnih delcev                        | Prof. dr. Samo Korpar, UNI MB + IJS                     |
| 10:00 - 10:15 | odmor                                                                  | vprašanja raziskovalcem                                 |
| 10:15 - 11:00 | Fizika osnovnih delcev                                                 | Prof. dr. Boštjan Golob, UNI LJ + IJS                   |
| 11:00 - 11:30 | Virtualni sprehod po spektrometru Belle II                             | Asist. dr. Luka Šantelj, UNI LJ + IJS                   |
| 11:30 - 12:15 | Analiza podatkov                                                       | Doc. dr. Marko Bračko, UNI MB + IJS                     |
| 12:15 - 13:30 | Kosilo                                                                 | pogovor z raziskovalci                                  |
| 13:30 - 16:00 | Delavnica– analiza podatkov, zajetih z eksperimentom Belle II          | Asist. Andrej Lozar, Anja Novosel , Luka Senekovič, IJS |
| 16:00 - 17:00 | Video konferenca – Rim, Strasbourg , Munchen + Belle II kontrolna soba | dr. Rok Pestotnik, IJS                                  |

# Eksperimentalne metode v fiziki osnovnih delcev

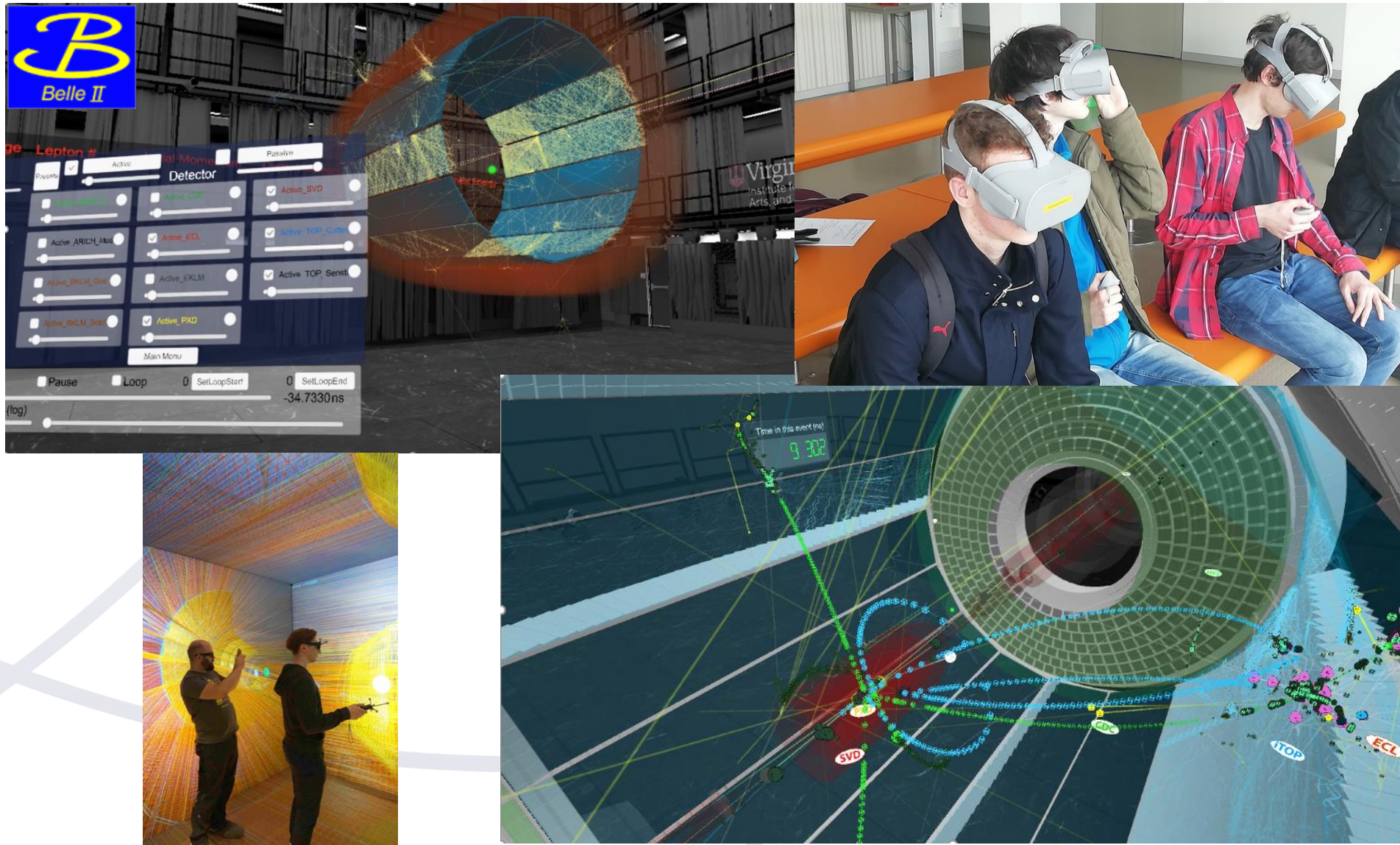


# Fizika osnovnih delcev

## Standard Model of Elementary Particles

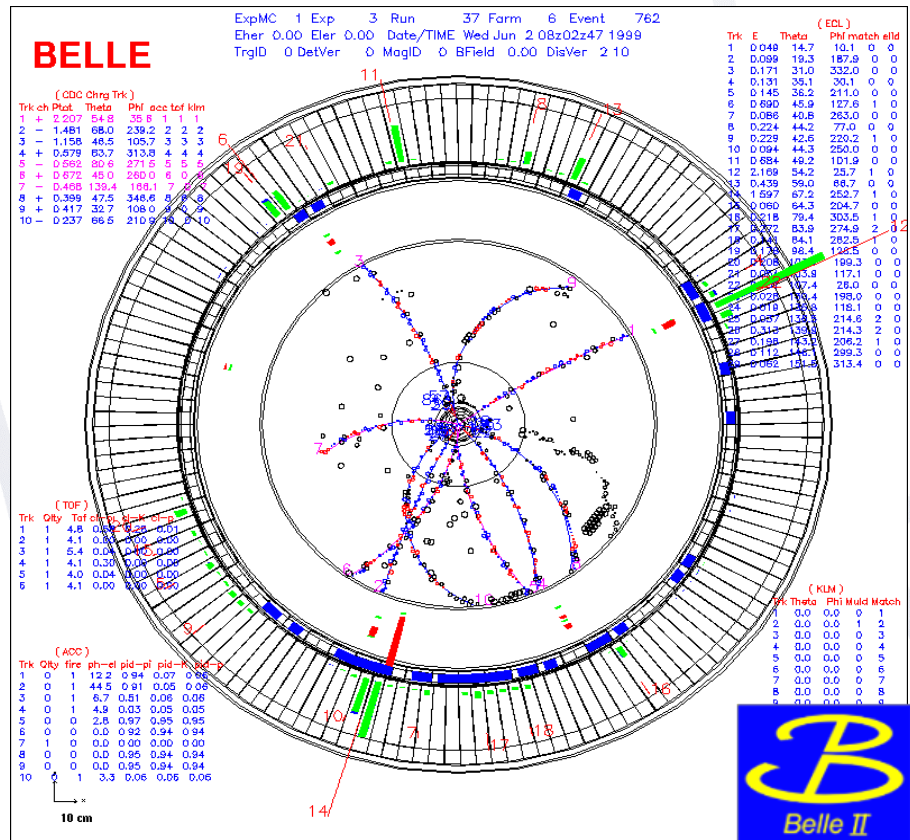
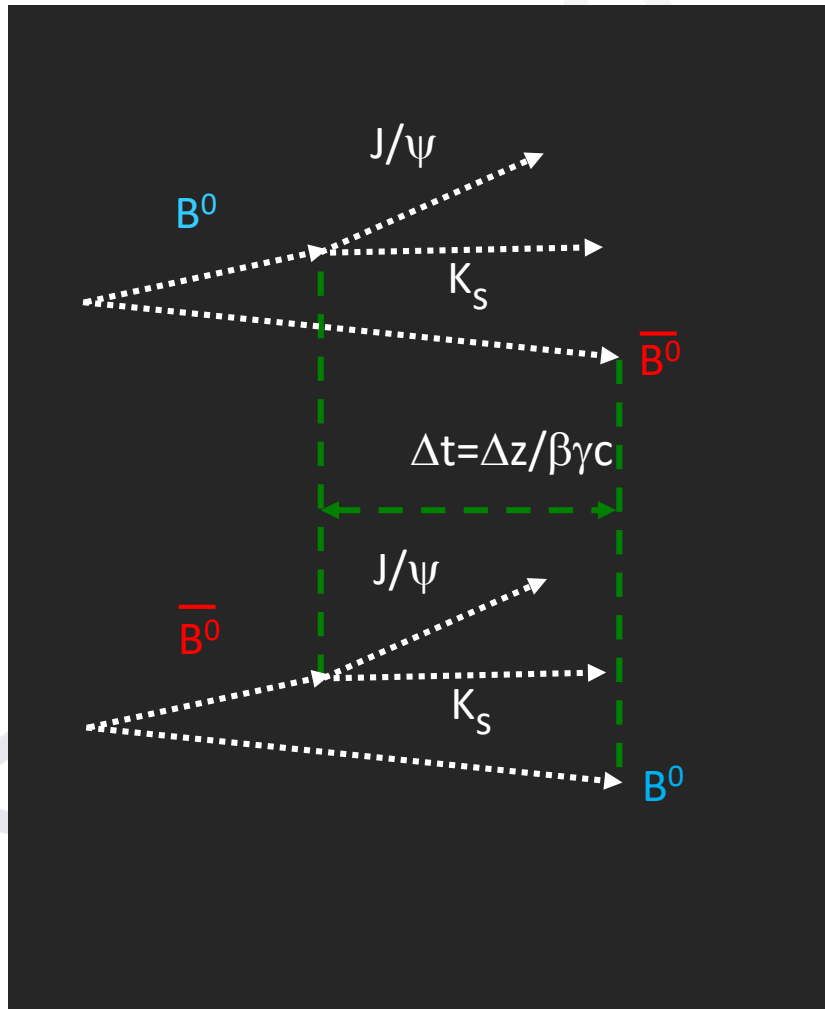


# Virtualni sprehod po detektorju Belle II



Belle II International Masterclasses 2021,  
video-povezava

# Analiza podatkov



# Delavnica – iskanje novih delcev

Run Analysis Interrupt Save Diagram Load Diagram

Particles  
Analysis  
Variables

Belle II Masterclass

Number of events: 50000

First event: 0

Data Source hadron-2

Print particle list? No

Particle List

Combine 2 particles

1. Particle

Select Particles

Particles

Charge 0

Type photon

Histogram

2. Particle

Select Particles

Particles

Charge 0

Type photon

Histogram

Same particle lists? No

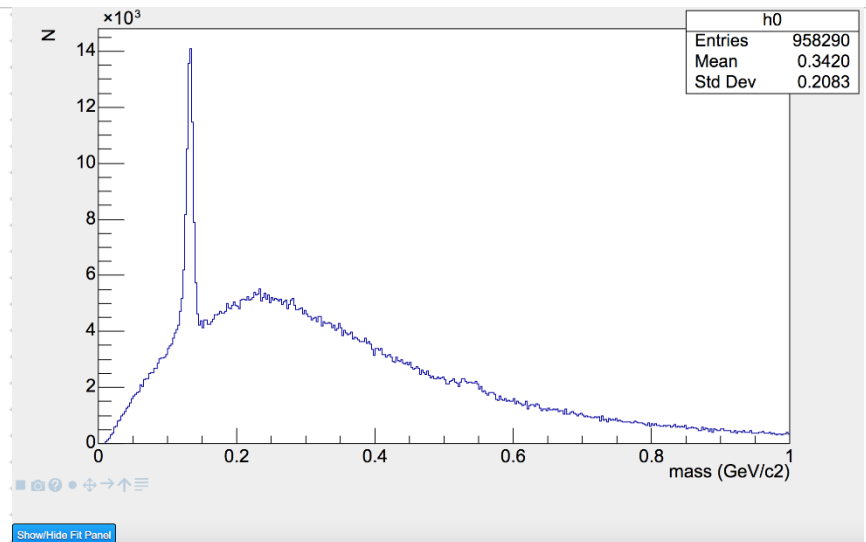
Set identity to pion

Min mass [GeV/c<sup>2</sup>] : 0.001

Max mass [GeV/c<sup>2</sup>] : 1

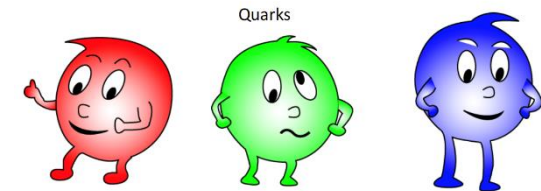
Histogram

Histogram Title pipi Mass;GeV/c;N Number of bins 400 Min: 0 Max: 1 Variable mass



# Video konferenca

- Povezava z dijaki iz Rima, Strasbourga, Munchna in Slovenije
- Predstavitev rezultatov
- Kviz – malo za hec
- Povezava s kontrolno sobo eksperimenta Belle II



## Quiz answers sheet

|   |                                                                                                        | Your score<br>In Luminosity                                                                           |
|---|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 8 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Target luminosity of SuperKEKB    |
| 2 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 7 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Very close to your goal           |
| 3 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 6 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Small beam currents increase      |
| 4 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 5 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Few additional bunches            |
| 5 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 4 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Implement all together            |
| 6 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 3 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Try to increase beam currents     |
| 7 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 2 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Try to increase number of bunches |
| 8 | A. <input type="radio"/> B. <input type="radio"/><br>C. <input type="radio"/> D. <input type="radio"/> | <input type="radio"/> 1 $10^{35}$ $\text{cm}^{-2} \text{s}^{-1}$<br>Try to squeeze more your beam     |

