

## T 27: Invited Topical Talks 2

Time: Tuesday 14:00–15:30

Location: Geb. 30.22: Gaede-HS

**Invited Topical Talk** T 27.1 Tue 14:00 Geb. 30.22: Gaede-HS

**Start up of Run 3 and performance of the upgraded LHCb experiment** — ●ELENA DALL'OCCHO — TU Dortmund, Dortmund, Germany

The LHCb experiment underwent a major upgrade during the last long shutdown in order to operate at fivefold increase in instantaneous luminosity compared to the previous runs. Among the major changes, the tracking system has been fully replaced and the readout of all subdetectors is now at 40 MHz with a fully software based trigger.

This talk will focus on how to transition from a newly installed detector to a fully functioning and performant system in a process known as commissioning, spanning from the hardware side to reconstruction, trigger, alignment and calibration. The preliminary performance of the detector will be presented, including subsystem specific and global figures such as tracking reconstruction and particle identification efficiencies. The aim of this year is to reach the design operating conditions, and plans to achieve it as well as prospects for this exciting data taking period will be described.

**Invited Topical Talk** T 27.2 Tue 14:30 Geb. 30.22: Gaede-HS

**Fully-inclusive measurement of  $B^{0,\pm} \rightarrow XJ/\psi$  processes at Belle II** — ●SVIATOSLAV BILOKIN — Ludwig Maximilian University, Munich, Germany

Studies of  $b \rightarrow c\bar{c}s$  processes, such as  $B^{0,\pm} \rightarrow K^{0,\pm}J/\psi$ , were at the core of the physics programs of the first generation of B-factories and served as the basis for the Nobel Prize in Physics 2008. Despite numerous measurements in the last few decades, many physics observables of

these processes remain unknown, especially for the higher-order resonances in the final state. Modern high-luminosity frontier experiments, such as Belle II at SuperKEKB, provide an ideal environment for advancing precision studies of  $b \rightarrow c\bar{c}s$  decays with inclusive final state.

In this contribution, we report the first measurements of the individual branching ratios  $BR(B^0 \rightarrow XJ/\psi)$  and  $BR(B^+ \rightarrow XJ/\psi)$  using a fully-inclusive approach at Belle II, where  $X$  represents strange-quark or light-quark hadrons. Additionally, the employment of hadronic tagging allows for a novel determination of the differential distributions of the helicity angle for the decay and the momentum magnitudes of the  $J/\psi$  in the  $B$  rest frame. These fully-inclusive measurements of  $B \rightarrow XJ/\psi$  decays represent an important milestone towards a fully-inclusive analysis of  $B \rightarrow X\ell^+\ell^-$  processes in the near future, which will serve as an excellent probe for New Physics searches.

**Invited Topical Talk** T 27.3 Tue 15:00 Geb. 30.22: Gaede-HS

**Probing Axion Dark Matter with Flavor Factories** — ●ROBERT ZIEGLER — Institut für Theoretische Teilchenphysik (TTP), Karlsruhe Institute of Technology (KIT)

Standard Model extensions with light axions are well-motivated by the observed Dark Matter abundance and the Peccei-Quinn solution to the Strong CP Problem. In general such axions can have large flavor-violating couplings to SM fermions, which arise naturally in scenarios where the Peccei-Quinn symmetry also explains the hierarchical pattern of fermion masses and mixing. I will discuss how these couplings allow for efficient axion production from the decays of SM particles, giving the opportunity to probe axion Dark Matter in precision flavor experiments, core-collapse supernovae and the early Universe.