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Upgrade of the ALICE Inner Tracking System

Tuesday 29 September 2015 15:40 (20 minutes)

During the long shutdown of the LHC in 2018/19 (LS2) the present Inner Tracking System (ITS) of the ALICE experiment based on silicon pixel,
silicon drift and silicon strip detectors, will be entirely replaced by a
new tracker using novel monolithic silicon pixel chips.
This new tracker will significantly enhance heavy flavor measurements, which
are out of reach for the present system,
e.g.
charmed
baryons,
such
as
the
ΛC,
and
will
allow
studying
hadrons
containing
a
beauty
quark.
The
new
tracker
will
provide
an
improved
pointing
resolution
in
r--
φ and
z,
decreasing
the
present
values
by
a
factor
3

and 5, respectively, to about 40 microns for a pT of 500 MeV/c. Each of the seven layers will be constructed using 50 micron thin silicon chips on a very light weight carbon fiber based support structure, allowing to achieve a very low material budget for the first three layers of 0.3% X0/layer and 0.8% X0/layer for the four

outer layers. The innermost layer will be placed at 23 mm radius, compared to presently 39 mm. Furthermore, the readout rate of the new ITS will increase from presently 1kHz to 50 kHz for Pb--Pb collisions and 400 kHz for p--p collisions, thus matching the expected event rate for Pb--Pb collisions after LS2. This presentation will provide an overview

of
the
upgrade
of
the
ALICE
ITS
and
the
expected
performance
improvement.
It
will
present
the
actual
status
of
the
R&D
and
give
an
outlook
on
the
construction
phase
starting
in
2016.

On behalf of collaboration:

ALICE

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Session Classification: Future Experimental Facilities, Upgrades, and Instrumentation

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