

The ITS3 detector and physics reach of the LS3 ALICE Upgrade

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During LHC LS3 (2026-28) ALICE will replace its inner-most three tracking layers by a new detector, “ITS3”, based on newly developed wafer-scale monolithic active pixel sensors, bent into cylindrical layers, and held in place by light carbon foam edge ribs. Unprecedented low values of material budget (0.07% per layer) and closeness to interaction point (19 mm) lead to a factor two improvement in pointing resolutions from very low p_T , achieving, for example, 18 μm in the transversal plane at 1 GeV/c.

After a successful R&D phase 2019-2023, which demonstrated the feasibility of this innovational detector, the final sensor and mechanics are being developed right now.

This contribution will shortly review the conceptual design, the main R&D achievements, and the road to completion and installation. It concludes with a projection of the improved physics performance, for heavy-flavour mesons and baryons, as well as for thermal dielectrons, that will come into reach with ITS3.

Alternate track

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