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Layout and prototyping of the new ATLAS Inner Tracker for the High Luminosity LHC

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The current inner tracker of the ATLAS experiment is foreseen to be replaced at the High Luminosity era of the LHC to cope with the occurring increase in occupancy, bandwidth and radiation damage. It will be replaced by an all-silicon system, the Inner Tracker (ITk). This new tracker will have both silicon pixel and silicon strip sub-systems aiming to provide tracking coverage up to $|\eta| < 4$.

For a high tracking performance are radiation hard and high-rate capable silicon sensors and readout electronics important. Moreover, services and stable, low mass mechanical structures are essential and give challenges to the system design. In this talk first the tracker layout and challenges, second possible solutions to these challenges will be discussed. The layouts under considerations and their technical realizations in terms of mechanics of local supports will be presented.

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