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Mechanical integration of the IDEA detector in the FCC-ee interaction region

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The Future Circular Collider FCC-ee aims at unprecedented luminosities to be obtained with the crab-waist collision scheme. In this talk we will describe the mechanical model of the interaction region layout including its assembly procedure.
After a discussion on the requirements and constraints, we will present the engineered design of the vacuum chamber with the cooling system, the bellows, the vertex and outer tracker detectors and their integration in a carbon-fibre lightweight structure that will support also the luminosity calorimeter.
The vacuum chamber consists of a central beam-pipe (18 cm long and 2 cm inner diameter, surrounded by a cooling manifold of 3.7 mm thickness) and a 1.1 meter long chamber that extends up to the bellows.
The vertex detector comprises three barrel layers between 13.7 and 34 mm radius, covering an angular acceptance of $|\cos(\theta)|<0.99$, made of a lightweight mechanical structure supporting MAPS Silicon detectors, air-cooled and is supported by the beam pipe.
The outer tracker, located at a larger radius , is composed of a barrel section and forward disks, made of DMAPS pixel detectors. It is cooled with distilled water pipes, and covers the same angular acceptance of the vertex detector.
The Luminosity calorimeter, placed at about 1 meter at either sides of the interaction point, is a multilayered active structure, in which 26 passive Tungsten circular disks, each of 3.5 mm thickness, are interleaved with 25 Silicon pad detectors, in a 1 mm housing. Its total weight is 65 kg per side. In order to measure the luminosity with an accuracy of the order of 10ˆ(-4) the calorimeter has a stringent requirement on the knowledge of its boundaries.
We will present the detailed structural simulations and the assembly sequence of all elements.

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