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## **Experience from the US contribution to HL-LHC: Nb3Sn focusing quadrupoles and SRF crab cavities**

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The Interaction Regions (IR) of many colliders benefit from the application of leading-edge technologies to ensure the highest possible luminosity delivered to the experiments. Leading-edge low-beta focusing magnets and crab cavities to handle individual bunches are critically important to increase the instantaneous and integrated luminosity in future Colliders.

The High-Luminosity LHC Upgrade, HL-LHC, with Nb3Sn Magnets (called MQXF) and Superconducting Radio Frequency (SRF) crab cavities (of two types, called DQW and RFD) is a world-wide collaborative project under construction in this decade to utilize the solutions mentioned above as key ingredients to increase tenfold the integrated luminosity delivered to the CMS and ATLAS experiments in the next decade. The HL-LHC AUP is the US effort to contribute approximately 50% of the low-beta focusing magnets and crab cavities for the HL-LHC.

In this contribution we present the valuable lessons learned by the US efforts in the procurement, construction, and testing phases of the Nb3Sn focusing magnets and SRF crab cavities. We will report on the experience gathered by HL-LHC AUP in the production of the first half of deliverables (magnets MQXFA03 to MQXFA13). We will also report on the test of the first cryoassemblies and the status of the cavities' development, production and testing.

Both the technical and project management lessons-learned will inform applications of these technologies to future colliders and projects.

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### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

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