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Nb₃Sn Coating of Complex Cavity Structures for SRF Accelerator Applications.

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The recently demonstrated performance of Nb₃Sn cavities makes this material attractive for SRF accelerator applications. While the majority of research efforts are focused on the development of elliptical single-cell and multi-cell cavities, the potential of this material is evident to other cavity types, which may have complex geometries. We are working towards the development of Nb₃Sn-coated Half-wave resonator and twin axis cavity at JLab. The Half-wave resonator with a coaxial structure provides data across different frequencies of interest useful for particle accelerators worldwide, whereas the twin axis cavity with two accelerating axes has been proposed for the Energy recovery linac applications. With their advanced geometries, larger surface area, increased number of ports and hard to reach areas, the usual coating approach must be evaluated and may need to be adjusted. We are commissioning a secondary Sn source in the coating system and will modify the current coating protocol to coat different complex cavity models. This presentation aims the current updates on such modifications and results we could obtain so far.

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