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Research and development of Nb3Sn SRF cavity at IHEP

Tuesday 23 September 2025 14:30 (3 hours)

Research of Nb3Sn superconducting radio-frequency (SRF) cavities was conducted at the Institute of High Energy Physics Chinese Academy of Sciences (IHEP), in order to improve the intrinsic quality factor (Q0) and accelerating gradient (Eacc). Various recipes of coating were attempted at SRF cavities and samples made of Nb, which resulted in different Sn content. It was found that the Sn content, namely the ratio of Nb/Sn, had great influences on the performance of Nb3Sn SRF cavities. When the ratio of Nb/Sn was slightly higher than 3, the Nb3Sn SRF cavities showed the best performance during the vertical test. Q0 of 1.3 GHz 1-cell Nb3Sn SRF cavity (the ratio of Nb/Sn ≈ 3.16) reached 3.0 × 1010 (@ 4.2 K) and 1.0 × 1011 (@ 2.0 K) at low RF field. Besides, conduction cooling of Nb3Sn SRF cavity has also been carried out at IHEP.

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Yes

Footnotes

Funding Agency

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