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The performance evaluation of 1.3 GHz 9-cell Tesla-type cavity

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Superconducting radio-frequency cavities made of pure bulk niobium (Nb) is an essential tool in modern accelerator science and technology. Nb superconducting radio-frequency (SRF) cavities can extremely efficiently accelerate charged particles. At the High Energy Accelerator Research Organization(KEK), Tesla-shaped 1.3 GHz Nb SRF cavities has been developed for next-generation accelerator experiments such as the International Liner Collider (ILC). The surface treatment is key for achieving the high performance of the Nb SRF cavity. In this study, we evaluated the performance of one Tesla-shaped 1.3 GHz Nb SRF cavity at KEK (KEK6). We treated KEK6 with the standard surface treatment: the cavity is treated by electropolishing, high-pressure ultrapure water rinsing, annealing, and 120 °C baking. Finally, we evaluated the cavity performance at the vertical test stand at KEK STF twice. We will report on the results in this presentation.

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Primary author: TSUMURA, Shusaku (Kyushu University)

Co-authors: UMEMORI, Kensei (KEK); KATAYAMA, ryo (The University of Tokyo)

Presenter: TSUMURA, Shusaku (Kyushu University)

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