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## **X-band dielectric assist accelerating structure.**

*Tuesday, 9 July 2024 12:00 (20 minutes)*

A dielectric assist accelerating (DAA) structure, which consists special dielectric cell structures operating in the  $TM_{02n}$  mode, is greatly superior in power efficiency compared with the conventional normal conducting copper structures. On the other hand, DAA structures stays at a low achievable accelerating gradient due to multipactor and breakdowns. To overcome these problems, we try to develop X-band standing-wave DAA structures and work to understand the physics of the breakdown phenomena occurring inside them.

A two-cell DAA structure composed by sapphire cell structures has been developed. The unloaded  $Q$  was measured to be above 60,000 at room temperature, in good agreement with the simulation results. This DAA structure is to be tested using the X-band high power test facility, Nextef2 at KEK. In the high-power test, we plan to perform a short pulse RF excitation using step pulse input in DAA structures to verify the potential of them to generate a high accelerating field. In this conference, we will present the status and progress in the development of the X-band DAA structure.

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