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Initial Studies on a Compact High-Gradient Ka-Band Accelerating Structure for Medical and Industrial Applications.

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Technological advancements are strongly required to fulfil demands for new accelerators devices from the compact or portable devices for radiotherapy to mobile cargo inspections and security, biology, energy and environmental applications, and ultimately for the next generation of colliders. New manufacturing techniques for hard-copper structures are being investigated in order to determine the maximum sustainable gradients around 150 MV/m and extremely low probability of RF breakdown. In this paper, the initial studies on the RF and mechanical design for a compact Ka-Band accelerating structure are presented as well as preliminary beam dynamics estimations.

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