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C-Band Distributed Coupling Structure Design and Wakefield Damping

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An advanced Normal-Conducting RF (NCRF) C-band accelerating structure has been designed for a high gradient, high power e⁺e⁻ linear collider linac in the TeV class. This design is attributed to the R&D advancement of an emerging class of distributed coupling accelerator topology exploring nominal cavity geometries. The accelerating structure features internal manifolds for distributing RF power separately to each cell, permitting the full structure geometry to be designed for high shunt impedance and low breakdown rate. Structures with such distributed coupling topology can be machined in two halves or quadrants that could lead to savings in fabrication cost. This machining technology also allows naturally to incorporate longitudinal slots that can be used to damp the higher-order-modes (HOM) which is an important requirement for the linear collider linac. We will present the structure design and wakefield damping studies for a C-Band distributed coupling structure.

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