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Advanced cooling and mechanics solutions for thin silicon ladders

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A brief description of R&D on cooling and mechanics. The all-silicon concept provides a self-supporting, ultra-transparent ladder design for applications where precision and material budget are key. We report results on the thermo-mechanical performance of all-silicon ladders in realistic conditions. A micro-channel cooling circuit has been integrated in the all-silicon ladder. The direct contact between coolant and heat source was shown to provide a thermal figure of merit that exceeds that of existing solutions significantly. This contribution gives an overview of progress so far and reports recent work to produce realistic all-silicon ladder prototypes with bump-bonded electronics.

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