



Contribution ID: 15

Type: not specified

Microchannels cooling plates

Friday 31 May 2024 09:30 (20 minutes)

Microchannel cooling technology offers an excellent thermal figure of merit solution to remove the heat from the front-end electronics and/or sensors. This presentation will cover different techniques and substrate materials to deliver the next generation of cooling plates based on power dissipation up to 2W/cm² (LHCb VELO Upgrade 2 as benchmark), material budget equal or below 0.5%X₀, better electronics integration and/or cost. Along those lines four different topics will be presented: Silicon microchannels via buried channels exploring better electronics integration via re-distribution metal layer; Silicon microchannels production via thermo-compression and hyperbaric process aiming for cost-reduction, integration and scalability; 3D metal printing for design flexibility and cost-reduction; ceramics manufacturing processes such as LTCC and HTCC to include electronic features in the cooling substrate by inclusion of lines in between layers or components on its surface.

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Session Classification: R&D session