

Contribution ID: 23

Type: Talk

MuPix chips, mechanics and cooling systems of Mu3e experiment

Thursday 17 October 2019 09:00 (22 minutes)

Mu3e is an upcoming experiment at Paul Scherrer Institut in the search for the strongly suppressed decay of μ -see. It will use an ultra-lightweight silicon pixel detector using thinned HV-CMOS MAPS chips. Untriggered, zero-suppressed, always-on operation is needed for observing random decays of muons at rest with a decay rate of 10^8-10^9 decays per second. More than 1 m2 of instrumented surface will produce about 3 kW of heat (<250 mW/cm2). Traditional cooling approaches are in conflict with the low-mass requirements, hence a gaseous helium flow cooling system will be implemented. This talk will give a report on the chip status, the mechanical design challenges with our solutions and the results of our comprehensive cooling studies performed recently.

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