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PTOLEMY: One Second After The Big Bang

Saad el Morabit

A Photograph Before the First Light (CMB)



CAN Symposium



Detector Concept





[arXiv:1902.05508] dx.doi.org/10.1088/2053-2571/ab21c9





arXiv:2111.14870v2

arXiv:1902.05508

PTOLEMY Experiment





Micro Microwave Electronics



Downconverter board

× × ×



FPGA evaluation board







Shielding.

Two "cantennas" attached to the RF region



Yuno Iwasaki (Princeton University)

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RF-cavity Studies



$|Re\bigl(\vec{E}(27GHz)e^{-i\omega t}\bigr)|$

Overmoded rectangular cavity given gyrating 18.6 keV e^- at origin



Rest of electronics



Conclusion





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Continuous magnetic field

× ×





Cyclotron radiation in a rectangular waveguide

× × ×





Slow ExB drift region

Additional Images for Electron Gyration

Using CR emission spectroscopy to interrogate trapped tritium gas

• Constraint of $m_{\nu} < 0.04 \ eV$ expected by Phase IV

× × ×

PTimeline

