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In the 70 years of CERN, how has particle physics electronics evolved?

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Abstract

Since CERN was founded, there have been significant changes in detector technologies which in turn have necessitated big changes in the readout and data acquisition electronics. Many of them have taken place since about 1990 during the preparations for LHC, profiting especially from the commercial impetus driving the rapid growth of consumer electronics. As a non-historian, and not even a qualified electronic engineer, I will attempt to trace how some of these technologies have evolved, citing examples with which I am most familiar, and make some comments about the challenges and risks for the future.

Biography

Geoff Hall is a Professor of Physics at Imperial College London, now semi-retired. He became involved with silicon detectors in the mid-1980s, originally motivated by a SLAC charm photoproduction experiment using a rapid-cycling bubble chamber, and contributed to the first UK experimental developments of silicon microstrips. This led into several other silicon sensor development projects, and then in the 1990s to silicon radiation damage studies and ASIC developments for the LHC, eventually culminating in the APV25 ASIC used by CMS and many other projects. With many students and colleagues he contributed to several electronic readout systems for the CMS experiment, which has more recently included ASIC and novel module developments for the CMS tracker HL-LHC upgrade.

Summary (500 words)

Presenter: HALL, Geoff

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