Sampling chip 3

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Context

This chip aims to read Micro-Channel Plate devices coupled to Transmission lines to provide large dimensions detectors with:

- 2‐dimension readout with a 1mm precision (Δt=10ps)
- Time of flight timing 1-10ps
Sampling electronics

Fast sampling electronics

- Records all the information from the detector pulse
- Provide picosecond timing resolution

See - G. Varner
    - S. Ritt
    - D. Breton, E. Delagnes
Timing resolution

Data taken at Argonne (Ed May’s laser test stand)

Differential timing resolution from T-line readout (10um MCP tube, 160PEs) for:

- 2-10GS/s sampling rates,
- 1 GHz 3dB analog bandwidth,
- 4-10 bit ADC resolutions.

No need to go much beyond 10GS/s and 7 bit with present MCPs.
Guidelines

• Push the 3dB analog bandwidth up to 1 GHz

• Sampling rate up to 10-15GS/s

• Digitize on-chip to 8-bit (and later signal process)

• Use the 130nm same 130nm CMOS process