2013-11-27
Wednesday, November 27, 2013
8:09 AM

* Irakli

- ISR / OSR done by oversampling.
- based on manual : remembers 4 samples
- ADC knows how many samples to average.
- 10 kHz ISR
  - DAQ crashed w/ Kabir laptop.
  - crashed at higher rate: note 32ch:
    50 kHz → 51.2 Mbit/s pushing data rate.
- NACC = ISR/OSR accumulator function.

* Kabir 10 kHz noise matches Johnson noise on preamp.
  - 2 measurements w/ preamp.
  - 1 w/o input, 1 w/ 9.5 V batery & 3.5 MΩ resistor current source.
  - measured each input pin
  - OSR = ISR = 10 kHz
    650000 samples in 65s each channel.
  - calculated noise for no input
    10 μV Johnson noise from gain resistor in preamp.
    2 MΩ gain resistor
  - experimental noise: 10 or 12 μV
    3.5 MΩ : 0.05V → 50 mV
    bare ADC : ? (will email)
  - Esti measured bare ADC @ 10kHz,
    averaged 4 successive samples
    → noise decreased by a factor of 2.

* David

- 400μs fine-grain enough to resolve

- preamp: 4μs rise time
  want to go to 400μs by boxcar
- boxcar inherent in ADC design
  - got from reading literature.

- looked for auto correlation → δ-function.

- one other thing: look at rise-time of preamp.
  - measure spectral response.
  - run at 10kHz & → 128 kHz.

run with/w/o preamp.

- need to beat down pickup
  - RMS value much higher w/ current source.

* Issues:
  - triggering on 10 MHz clock? → continuous readout.
  - synchronizing clock? ✓
  - trigger + N-samp ✓
  - readout 36 channels + 1 →
  - boxcar firmware. → ISR/OSR
  - digital out bit?

* Jitter: 10 MHz clock
  - running at 10 kHz → 100ns jitter?
    128 kHz → 8μs

10 V/16ms × 8μs. = 5mV

* New ACQ 435 ELF

TI ADC - same chip?

* Kabir: 4 modes,

  - tested each
  - has script with all parameters for 1 mode
  - figuring out parameters for 3 other modes.