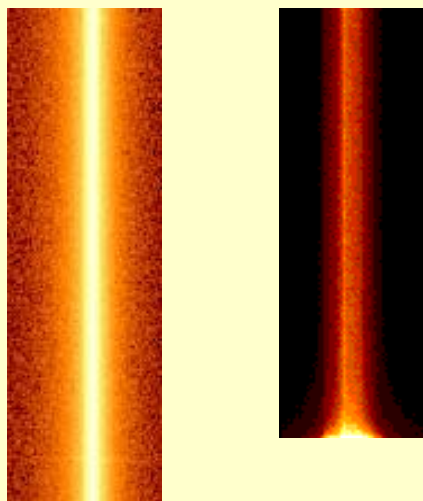
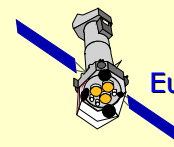


# Correct treatment of fast mode ARFs

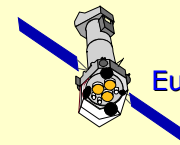


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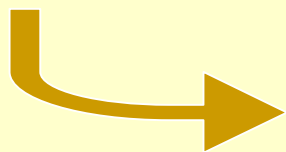
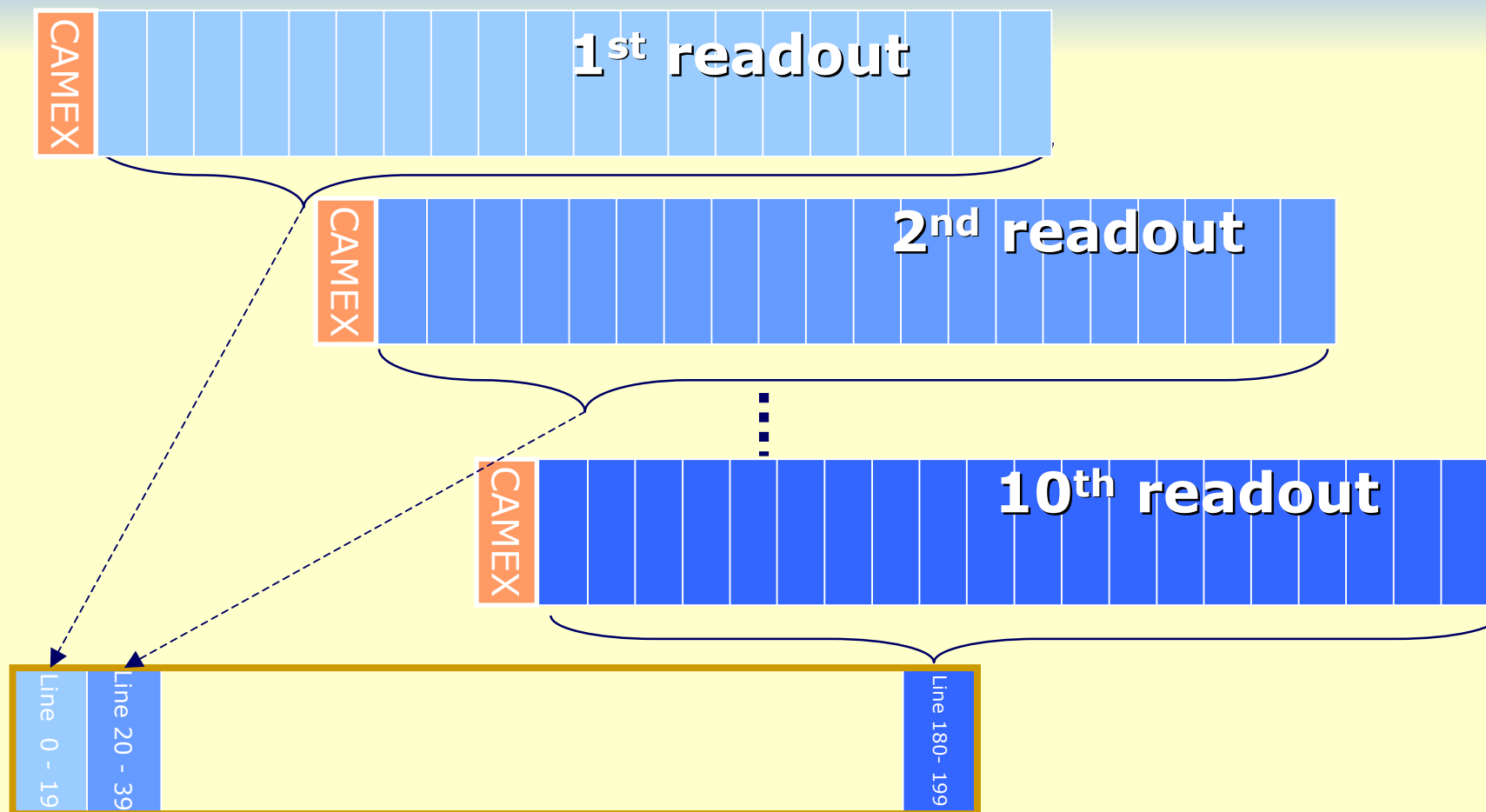


## menu

- recap fast mode operations
- Extraction region normalization treatment in fast modes
- arf generation window versus fast modes



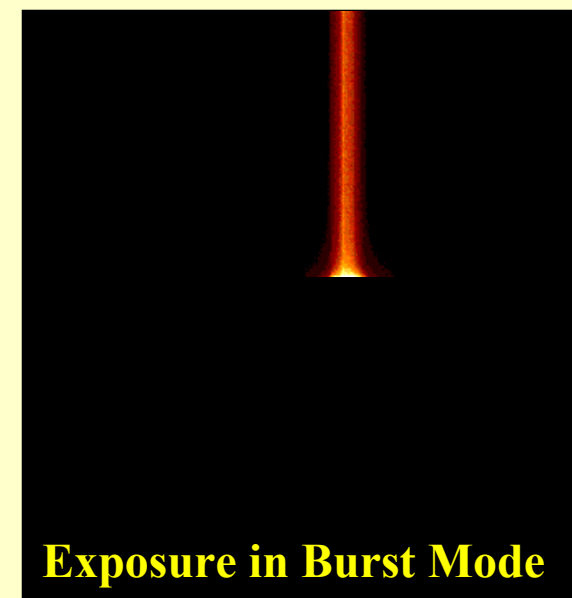
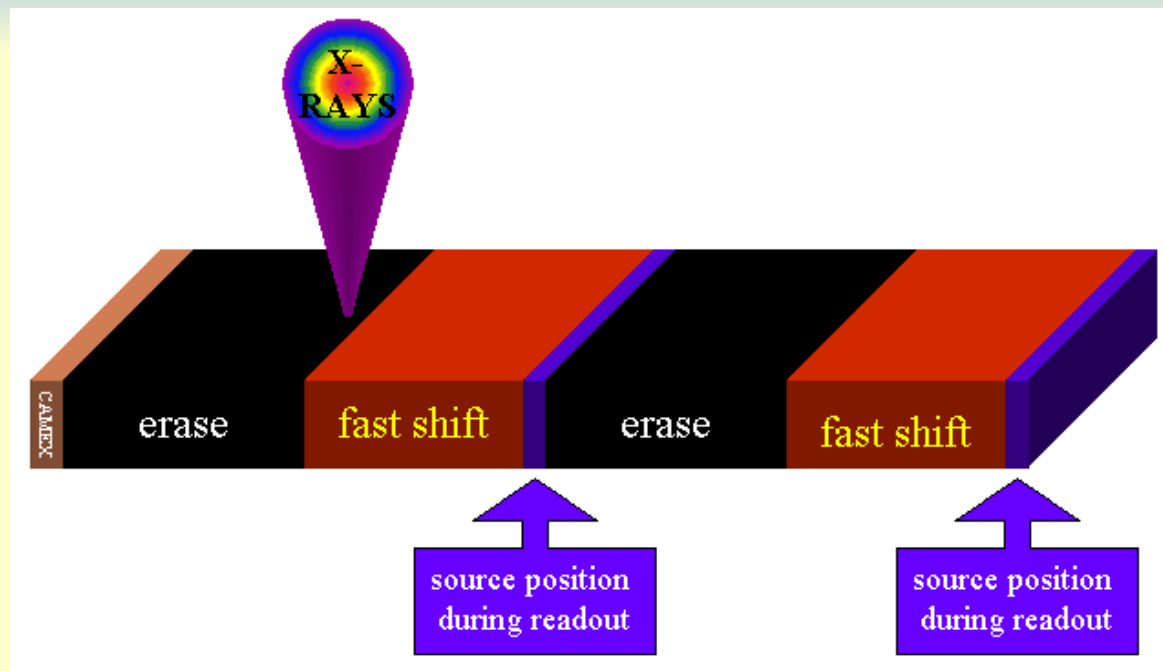
# CCD readout in Timing Mode



**Pseudo (macro) CCD:**  
64 x 200 macro pixel,  
contains information  
from 10 real CCD readouts

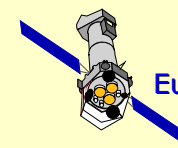


# EPIC-pn Burst Mode



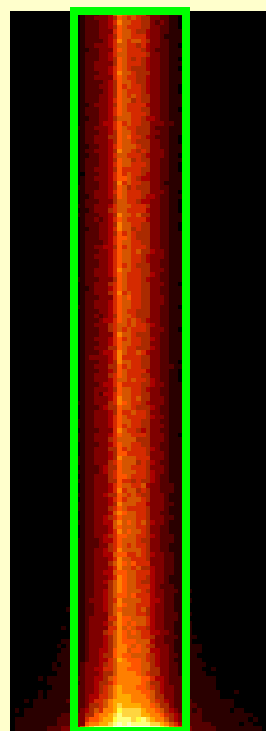
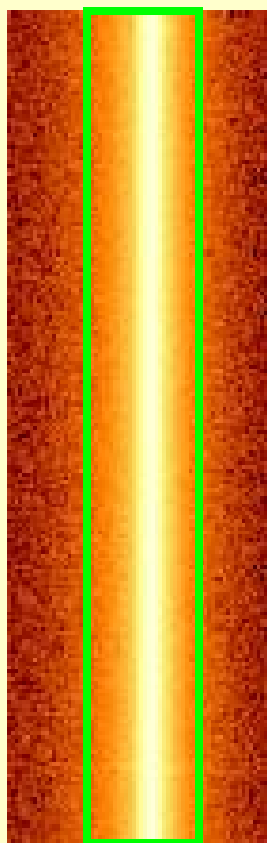
- Burst Mode

- fast transfer of pixels under PSF
- time resolution: **7  $\mu$ s**
- life time only 3 %
- Max. count rate (flux) point source [ $s^{-1}$ ] ([mCrab]) : **60000 (6300)**

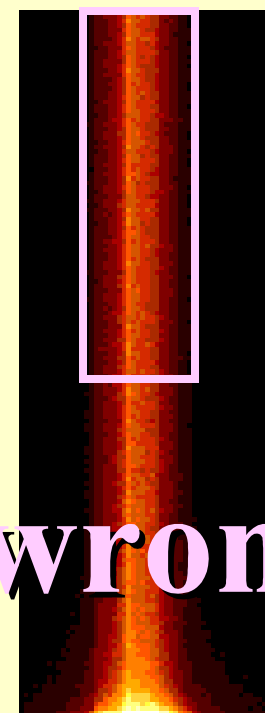
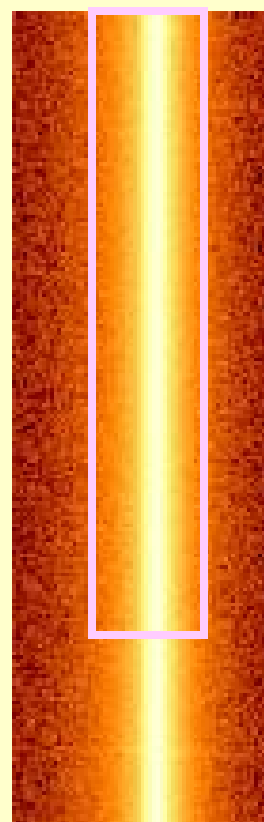


## Normalization pre 6.1

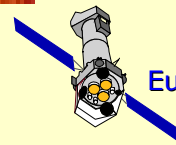
- Arfgen assumed an extraction region with Y-extent: 200(Timing), 180 (Burst)



ok

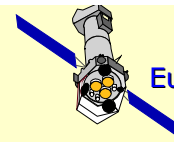
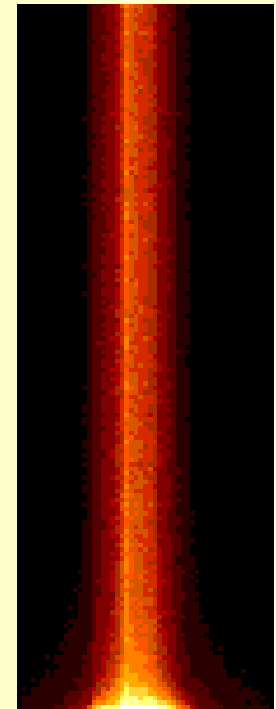
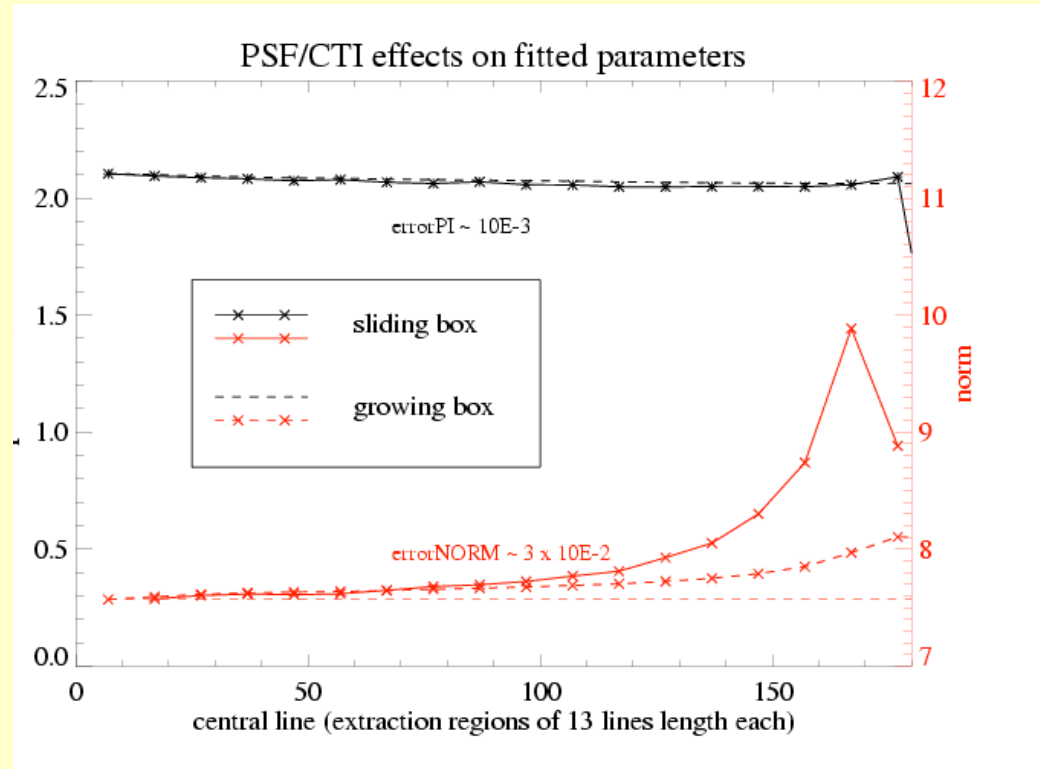


wrong

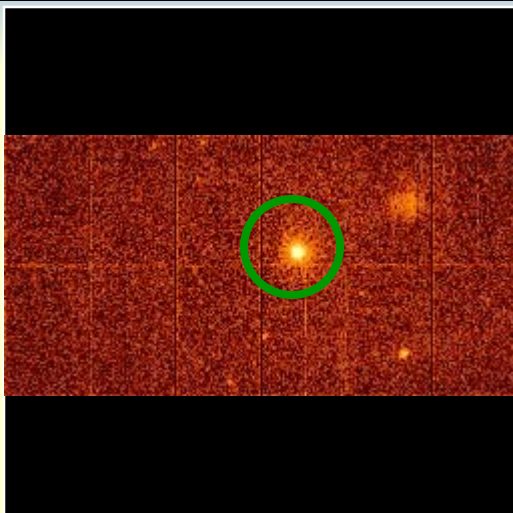


# Normalization 6.1

- Arfgen now scales with extraction region Y-extent: Y/200(Timing), Y/180 (Burst)
- Timing mode trivial
- Burst mode complicated, because part of PSF is leaking into fast shift recorded events during slow read out

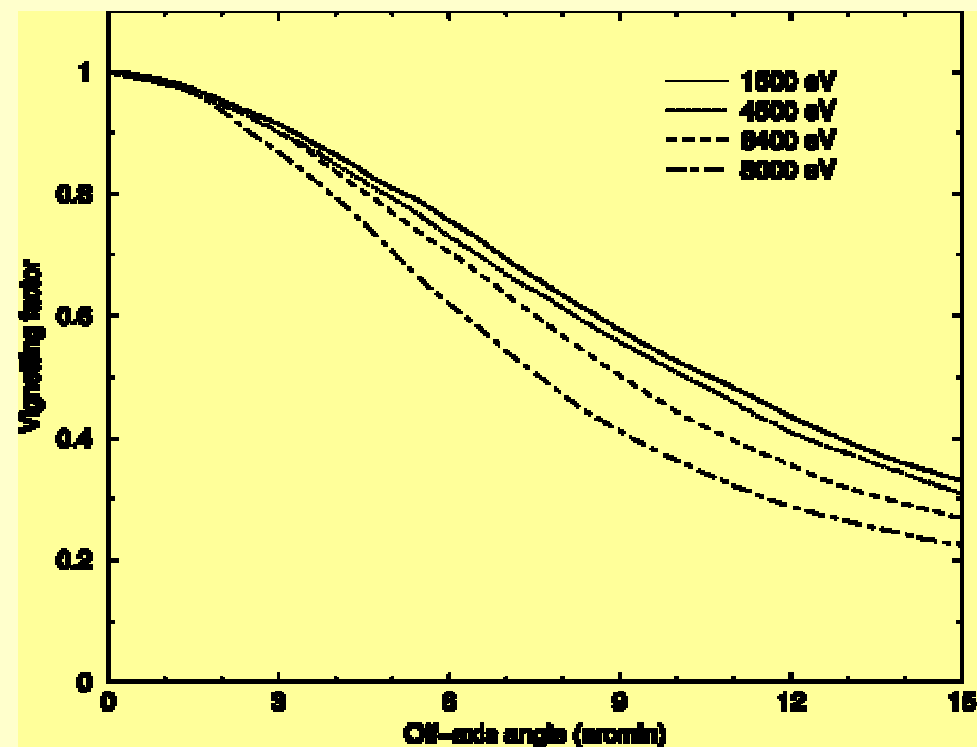
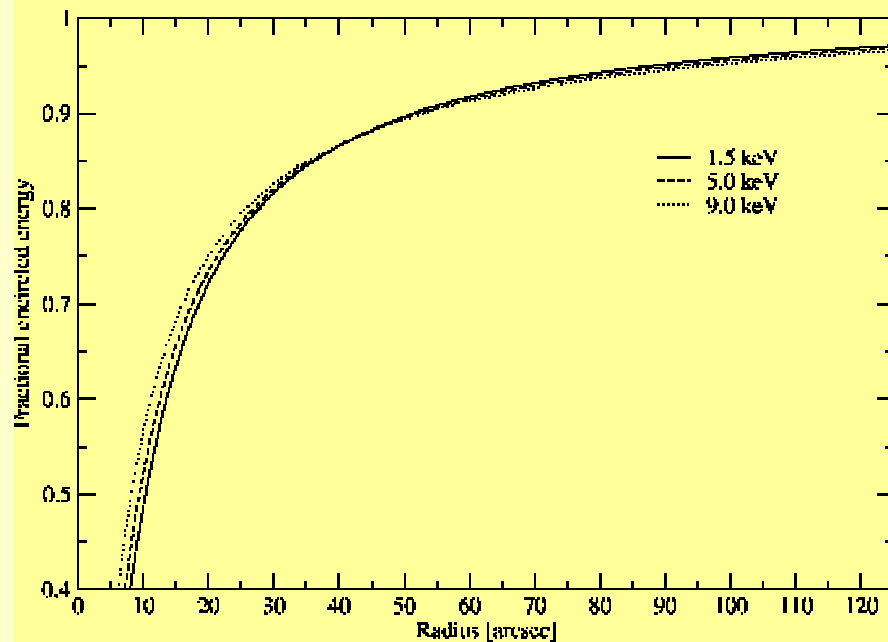


# Situation for Window modes



PN encircled energy (from PSF integration)

- Arfgen takes into account:
  - PSF
  - Vignetting



# Fast modes 6.1

- Arfgen corrects for Y-extent of extraction region, but still not for PSF (and Vignetting → straight forward)
  - PSF:
    - X-direction normal PSF distribution
    - Y-direction:
      - Direction towards CAMEX 99.99 % PSF
      - Direction opposite CAMEX 85 % PSF
- 2 dim PSF needs to be integrated not averaged

