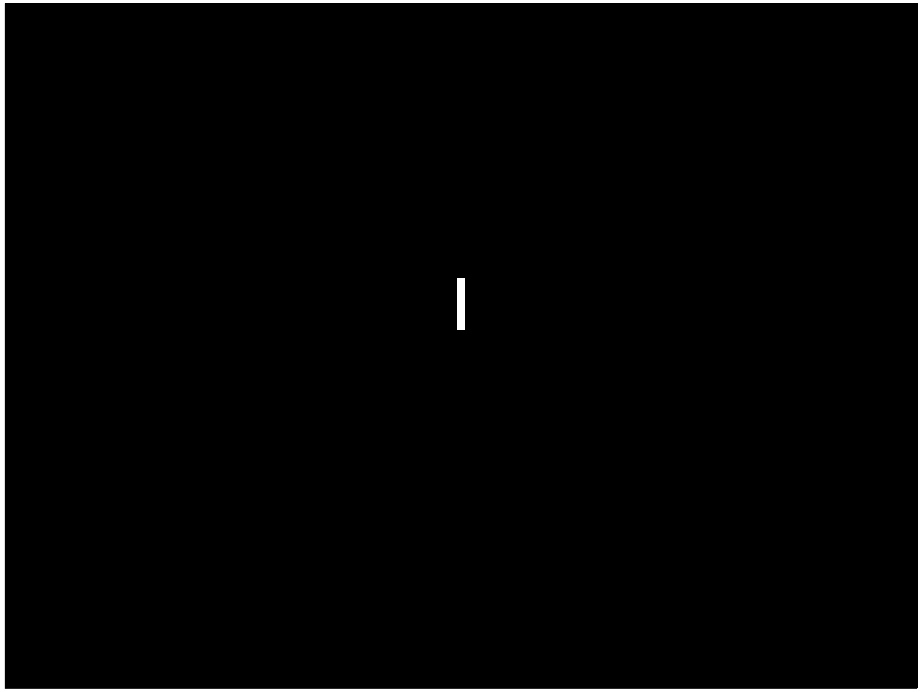

beats Pisa



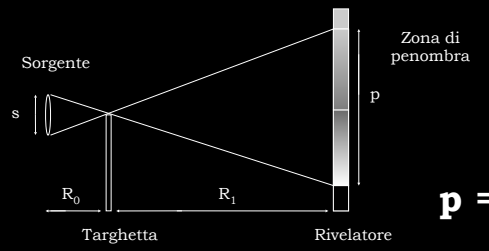
Attività attuale
(dall'ultima riunione ad oggi)

- Caratterizzazione della nuova strumentazione
- Misure in condizioni BNL-like

Nuovo Tubo

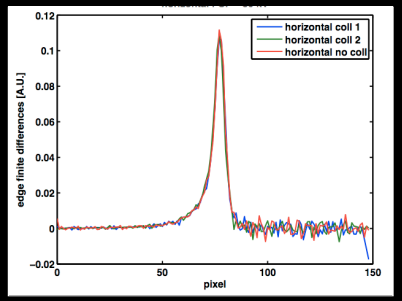
tubo microfocus Hamamatsu (W, 5μm, 10-90kVp)

Misura di spot-size: si proietta un edge e si misura la penombra



$$p = s \times (R_1 / R_0)$$

Nuovo Tubo



spot size FWHM [μm]		
10 kV	20 kV	30 kV
$14 \pm ?$	6.0 ± 0.8	4.7 ± 0.8

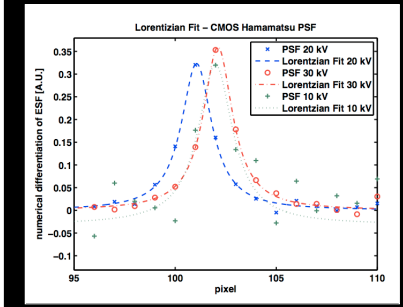
Nuovo Rivelatore

Flat panel Hamamtsu (CMOS, CsI, 50mmX50mm, pixel 50μm,

- Misura PSF
- Misure rumore
- Misure curva caratteristica

Nuovo Rivelatore

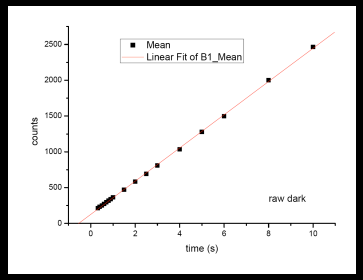
Misura PSF

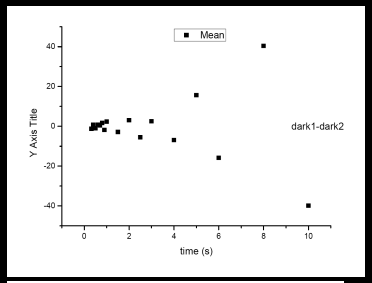


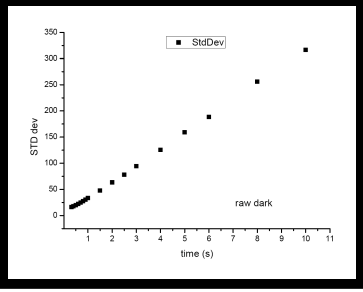
CMOS PSF FWHM [μm]		
10 kV	20 kV	30 kV
106 ± 45	91 ± 15	88 ± 11

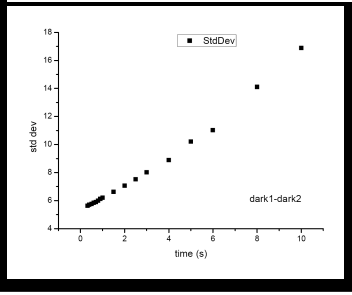
Nuovo Rivelatore

Rumore



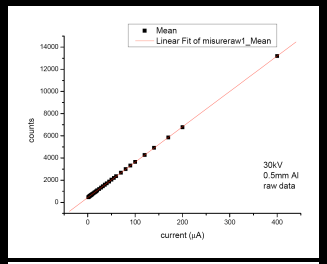


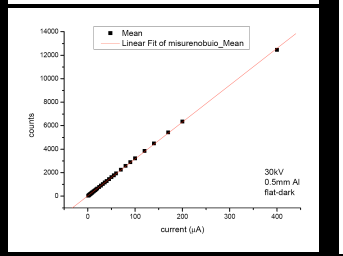


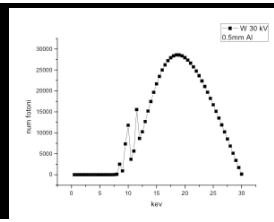


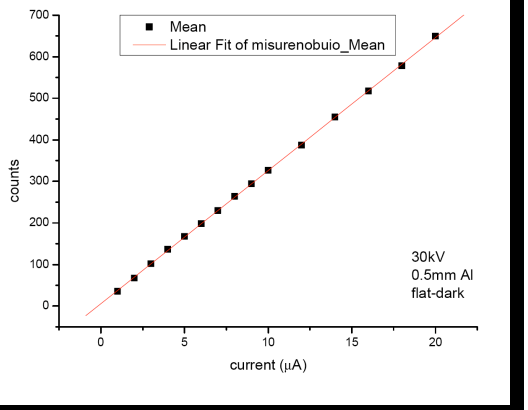
Nuovo Rivelatore

Curva caratteristica









Condizione BNL-like

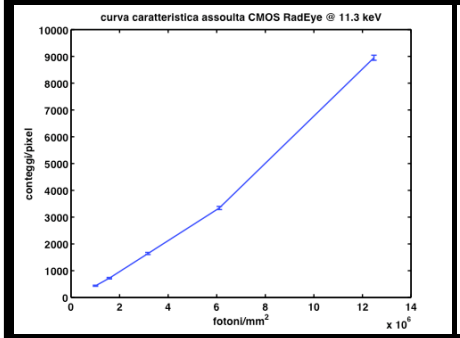
Attualmente $3.5*10^3$ fotoni al mm^2 per shot
(@7.4 keV e 1515 mm di aria)

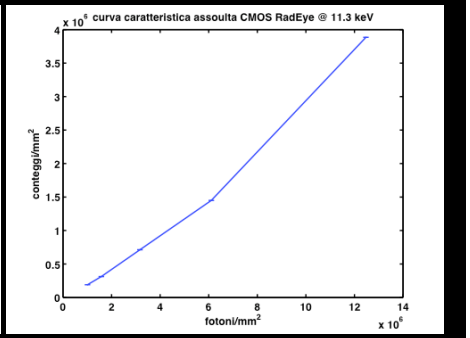
- $2*10^7$ fotoni per shot
- energia 10 keV
- con 151 cm sotto vuoto : $3.5*10^4$ al mm^2
- con 151 cm aria (att. 60%): $1.4*10^4$ al mm^2
- con 151 cm di He (att. 1%): $3.5*10^4$ al mm^2

Con 10 spari (in vuoto o con He) si arriva a
$3.5*10^5$ fotoni al mm^2

Misure a Ferrara

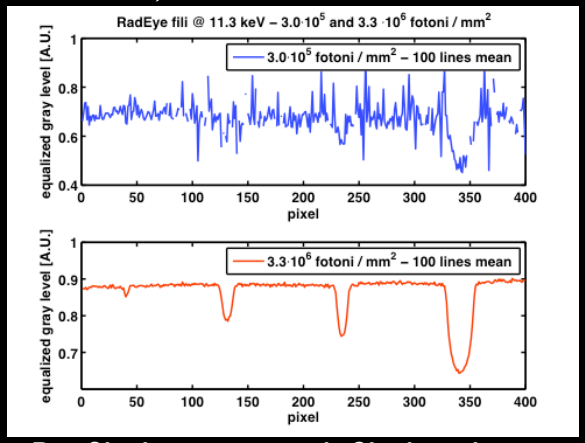
CMOS RAD-EYE, fascio monocromatizzato a 11.3 keV





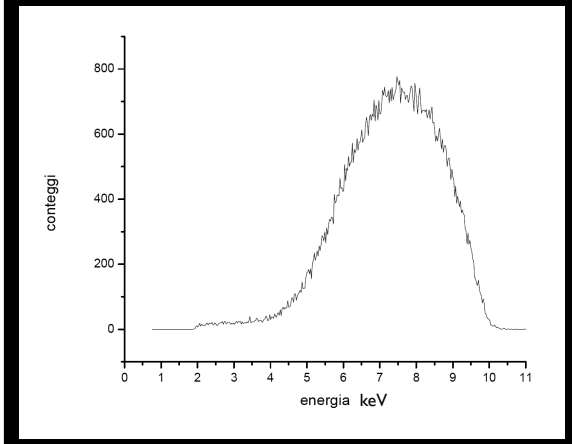
Misure a Ferrara

CMOS RAD-EYE, fascio monocromatizzato a 11.3 keV



Profili di immagini di fili di polimeri

Misure a Pisa

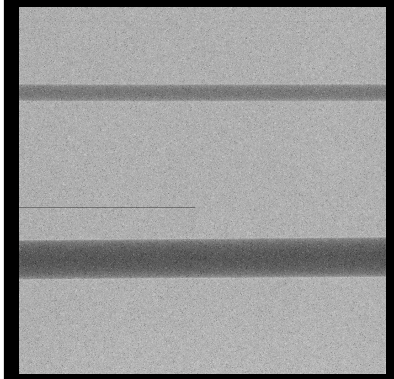


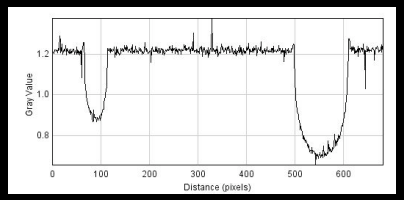
- Spettro misurato (FLUXEN)
- 10 kVp senza filtri
- 4μA ($3.5*10^2$ fotoni/s*mm^2)
- Energia media 7.5 keV
- Spread: ~30%

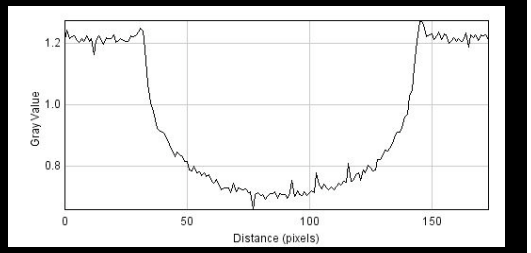
Misure a Pisa

S-O: 15 cm
O-D: 55 cm
$3.5*10^5$ fotoni/mm^2

Flat panel Hamamatsu
Immagine di polimeri
PMMA 0.5mm e PET 0.25mm







10 kV, 40μA,
10 immagini da 10 secondi

Attività future

•Completare la caratterizzazione della strumentazione

•Laboratorio raggi X a Frascati
•Misure a BNL
•Sistemi di caratterizzazione dei fasci X (flusso, spettro)
•Imaging con contrasto di fase (tomografia)

Spettrometro con cristallo curvo

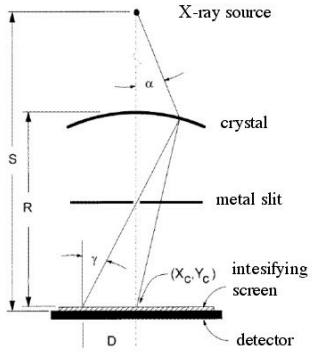
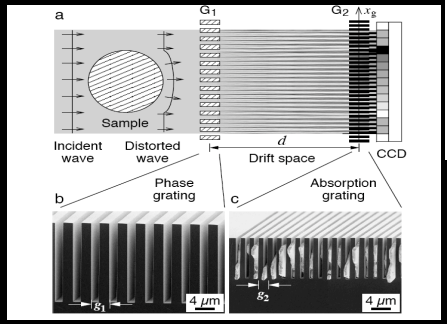


Fig. 1: The scheme of the spectrometer

Imaging

Grating interferometer (David, 2002) (Momose, 2003)



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Soft-tissue phase-contrast tomography with an x-ray tube source

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Imaging

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Quantitative quasi-local tomography using absorption and phase contrast

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Polychromatic cone-beam phase-contrast tomography

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A method is presented for quantitative phase-contrast tomography using unfiltered radiation from a small polychromatic source. The three-dimensional distribution of complex refractive index in a monomorphous object is reconstructed given a single projection image per view angle. The reconstruction algorithm is achromatic and stable with respect to high-spatial-frequency noise, in contrast to conventional tomography. The density distribution in a test sample was accurately reconstructed from polychromatic phase-contrast data collected with a point-projection x-ray microscope.

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Phase-contrast tomography of single-material objects from few projections

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persone

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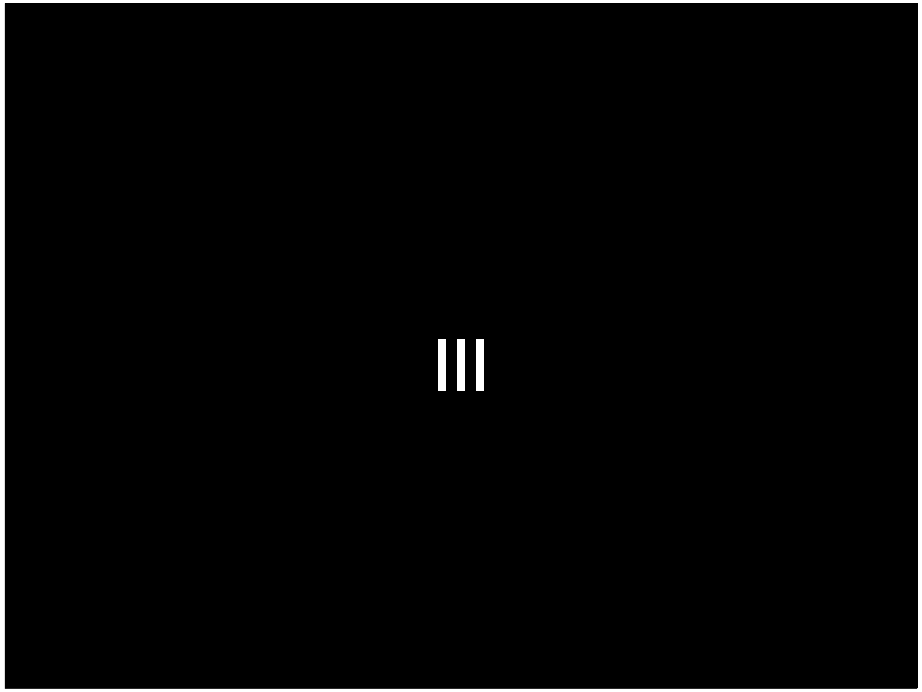
2. P. Delogu
3. M. Endrizzi
4. A. Stefanini

F. Bosi

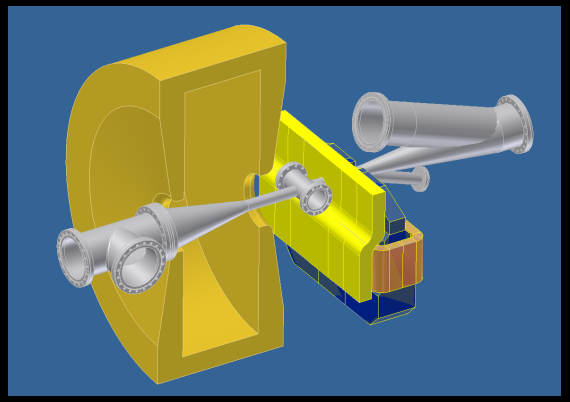
G. Agnello ? S. Di Maria ?

Possibili richieste

- MI: 15 keuro (considerata l'attività a Frascati)
- ME: 15 keuro (considerata l'attività a BNL)
- Consumo: 7 keuro (metabolismo vario, gratings?)
- Inventariabile/costruzione apparati: 15 keuro
  - Sistema per la misura del flusso
  - Sistemi spettrometrici
  - Movimentazioni e controlli per tomografia



Camera di interazione



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Frascatani

P. Delogu
P. Oliva