

COLLABORAZIONI LABORATORIO NIXT (*New Imaging X-ray Technologies*)



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Our team:



Head of

Lab **NIXT** (**N**ew **I**maging **X**-ray **T**echniques)
in ENEA-Frascati



LE ATTIVITA' DEL LABORATORIO NIXT SONO IN UN QUADRO DI COLLABORAZIONE ITALIANA E SI SVILUPPANO SU DIVERSE TECNOLOGIE E RIVELATORI PER RADIAZIONE X, GAMMA E NEUTRONICA

Lab NIXT DETECTORS PORTFOLIO

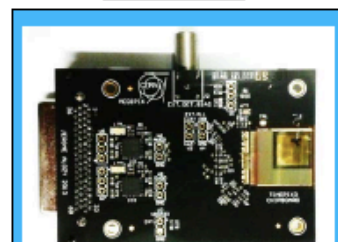


HYBRID
GAS-ASIC

in collab. with:

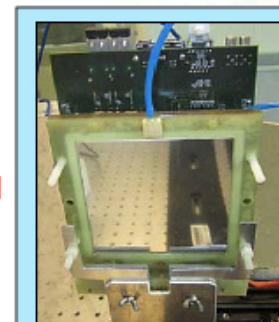


HYBRID



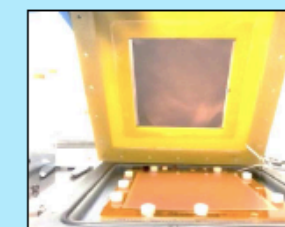
6 - GEMPix

1 - GEM



GAS

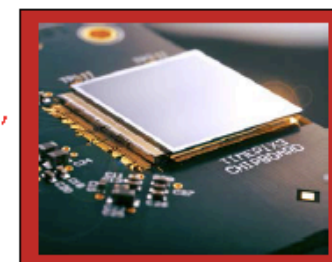
2 - BORATED
GEM



5 - Diamondpix
with CVD

4 - Timepix, Timepix3
with neutron
converter

3 - Timepix,
Timepix3



SOLID STATE

~1meV

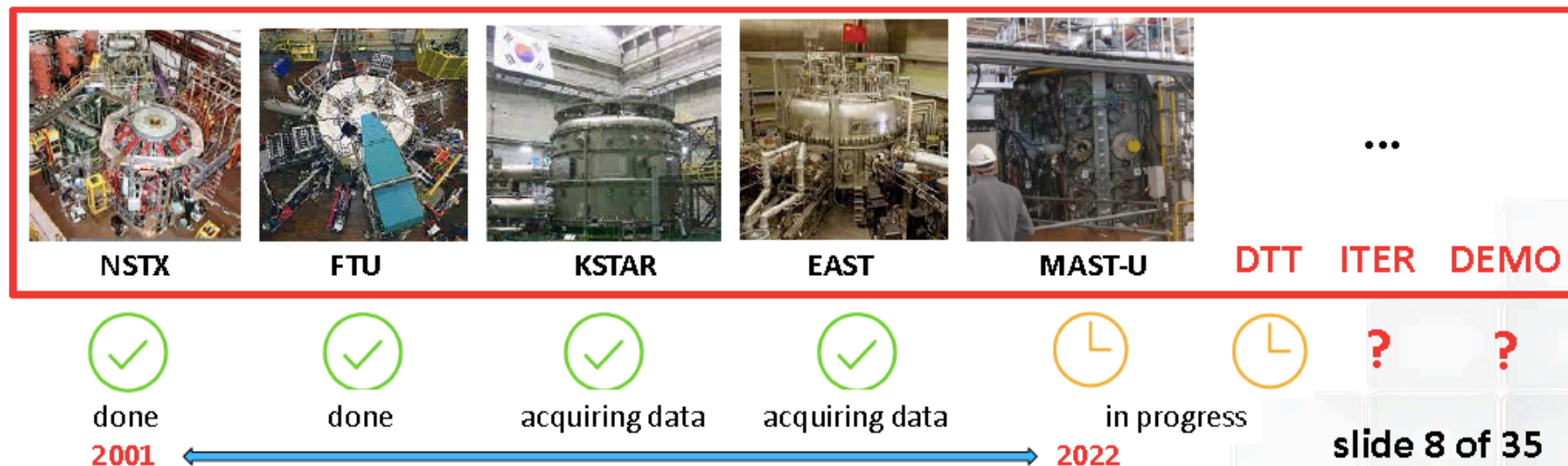
Energy range investigated

~10 MeV

slide 2 of 35

FUSIONE MAGNETICA

- KSTAR camera GEM 2-D installata dal 2013
- EAST camera GEM 2-D installata dal 2015
- DTT 2 task per diagnostiche SXR con GEM dal 2011
- MAST: installazione GEM nuova generazione (2011)
- ITER : New advanced detectors for X-ray camera (in avvio)



FUSIONE INERZIALE

- ER-IFE 2019- 2020 e 2021-2023
- Collaborazione con Università di Bordeaux dal 2015 (D. Batani)
- Esperimenti a Eclipse (Bordeaux), VEGA (Spagna), Gekko XII (Giappone)

The GEMpix



2015-2017

175 mJ 39 fs
 $4.5 \cdot 10^{12}$ W
Spot 10 μ m

$G_{GEM} = 900$ V

No EMP
noise



2018

6,5 J 35 fs
 $1.8 \cdot 10^{14}$ W
Spot 30 μ m

$G_{GEM} = 620$ V

No EMP
noise



Sep. 2019

1,5 KJ 5 ns
 $3 \cdot 10^{11}$ W
Spot 300 μ m

$G_{GEM} = 200$ V

No EMP
noise

Same signal !

slide 32 of 35

NEUTRONICA

- Collaborazione con La Facoltà di Ingegneria dell'università di Roma La Sapienza (Dottoranda Antonella Tamburrino)

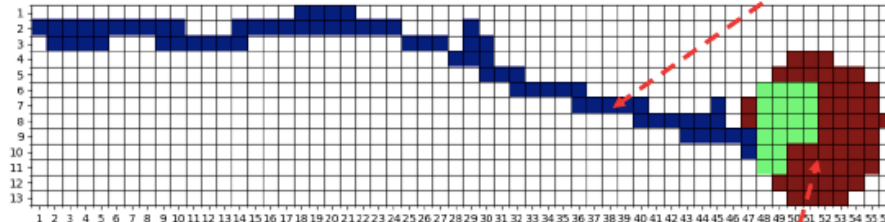
TPX3 for Radon measurement



Part of Radon decay chain:

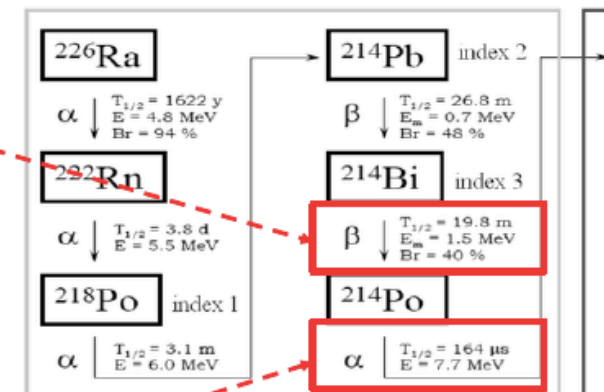


ToA graph



1.5 MeV e-
ToA ~ 2500 ns

7.7 MeV alpha
ToA ~ 182500 ns



Single cluster difference of $\Delta t \sim 180 \text{ us}$
to be compared with the theoretical
statistical difference of $\Delta t \sim 164 \text{ us}$

Using the sharp differences in **ToA**, it's possible to split the above single cluster in two clusters: one for the **beta track** and the other for the **alpha track**

APPLICAZIONI

MICROTOMOGRAFIA SOFT X-RAY DI MESOSCALA PER CAMPIONI BIOLOGICI CON RISOLUZIONE IN OTTIMIZZATA BANDA DI ENERGIA

In collaborazione con centro di biologia marina dell'ENEA di Santa Teresa (La Spezia)

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G. CERRATI, A. PEIRANO**

Biodiversity and Ecosystem Services Laboratory
Santa Teresa Research Centre, La Spezia

S. COCITO

Division Protection and Enhancement
of the Natural Capital
Santa Teresa Research Centre, La Spezia

**D. PACELLA, G. CLAPS
F. ANDREOLI, L. GABELLIERI**

Sources, Antennas and Diagnostics Laboratory
Frascati Research Centre, Rome

M. ADANI

Atmospheric Pollution Laboratory
Bologna Research Centre, Bologna

WILL CORALLINE ALGAE REEF MITIGATE CLIMATE CHANGE EFFECTS ON ASSOCIATED FAUNA?

A methodological approach to develop "MIMICS" of
coralline algae *Ellisolandia elongata* for climate change studies

M. NANNINI, S. ALIANI

CNR - Institute of Marine Science
Via Santa Teresa, 19032 Pozzuolo di Lerici, La Spezia

A. LUCHETTA, C. CANTONI

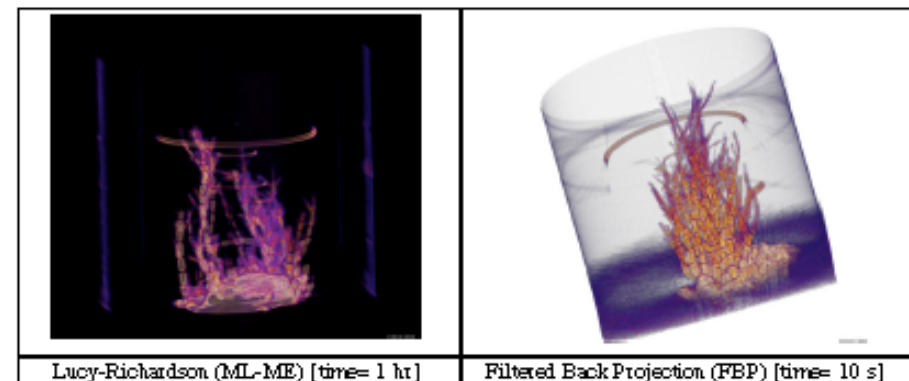
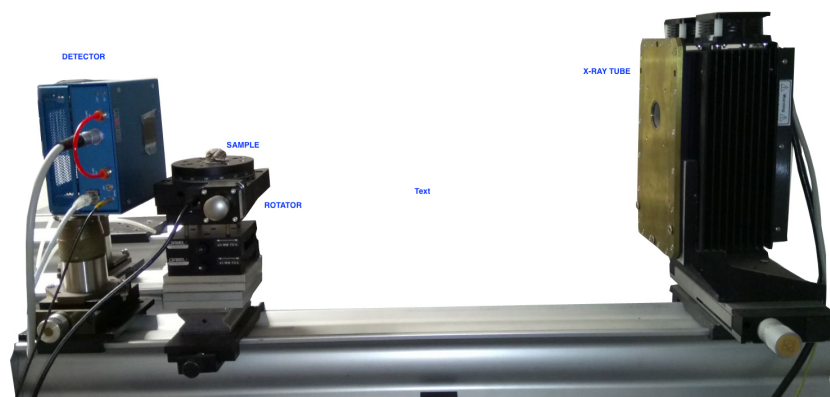
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SUMMARY 1/2

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NEUTRONICA

- Collaborazione con La Sapienza (Dottoranda Antonella Tamburrino)

APPLICAZIONI

- Microtomografia soft-X per biologia marina (ENEA S: Teresa)

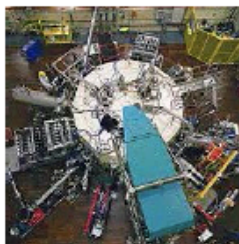
Summary 2/2



NSTX



FTU



KSTAR



EAST



MAST-U



DTT

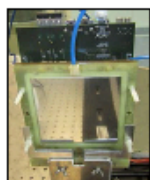
ITER

DEMO

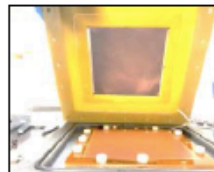
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Magnetic confined plasmas

1-GEM



2-BORATED GEM



3-TPX, TPX3



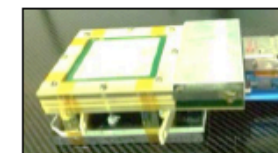
4-TPX, TPX3 w. convert.



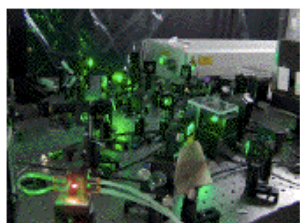
5-Diamodpix



6-GEMpix



Laser produced plasmas



ECLIPSE(Bordeaux)



VEGA-2 (Salamanca)



Gekko XII (Japan)

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