

# Working session on Standard Candles

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- Definition of standard candles
  - Sources with constant X-ray flux: white dwarfs
    - isolated neutron stars
    - supernova remnants
    - cluster of galaxies
- Scientific drivers for accurate absolute fluxes
  - neutron star radii
  - cosmology (e.g. total mass of galaxy clusters, Sunyaev Zeldovic effect)
- Calibration purposes
  - absolute flux calibration
  - energy scale, energy resolution, (CCD) re-distribution
  - regular monitoring of a suitable subsample of standard candles is recommended

# Celestial Sources

White dwarfs

HZ43

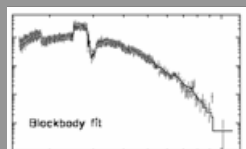
Sirius B

GD153

Neutron stars

RXJ1856

PSR0656

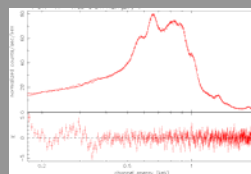
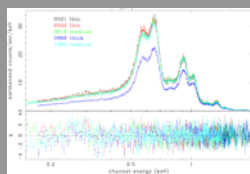


Supernova remnants

1E0102

N132D

Cas-A

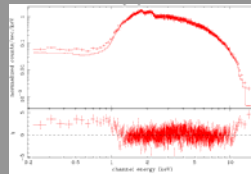
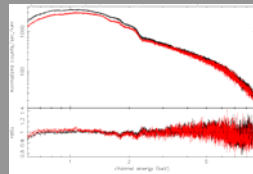


non-thermal SNRs

Crab

G21.5

(3C58 5'x8')



PSR1509

0540-69

Cluster of galaxies

To be defined: bright, small, simple

# Celestial Sources: usage by current missions

XMM	:	RXJ1856 1E0102		Crab		N132D	GD153
Chandra	:	RXJ1856 1E0102	CAS A			G21.5	
Suzaku	:	RXJ1856 1E0102	CAS A	Crab			
RXTE	:		CAS A	Crab			
Swift	:	RXJ1856 1E0102	CAS A	Crab			
INTEGRAL	:		CAS A	Crab			

## "Laboratory" absolute standards

dedicated calibration mission

new developments of X-ray sources useful for calibration

## Standard candles and models

agreement on model parameters

tabulate model to “save” it

include statistical errors and differences between instruments “band of models”