

Energy Scale and Redistribution Working Group

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Start with good ground cal

- Spectrally simple lab sources
- Developed physical model of detector

Complicated by changes on orbit

- Adjust model parameters
- Radiation damage, additional CTI, effects gain and redistribution

Preliminary Gain Calibration Target List

(Redistribution target list will have
much overlap)

Target	Energy Range (keV)	Flux (ergs/s/cm ²)	Extent	Type of spectrum	Variable	Mission	Issues?
Fe55 cal sources	5.9 keV + other lines	NA	Mission-dependent	Lines & continuum	Decaying	Everybody	No low energies
E0102	0.5-2	2.2×10^{-11}	45''	Lines & continuum	No	Everybody	
N132D	0.5-7	1×10^{-10}	1'	Lines & continuum	No	XMM	
Zeta Puppis	0.4 keV line	Bright	Point source	Lines (nitrogen)	Stable except when it isn't	XMM	Optically bright
Vela	0.5 keV line		Large	Lines (oxygen)	No	XMM	
RXJ1856	0.1-1	1×10^{-11}	Point source	Continuum	No	XMM	
Cas A	0.3-10	2.6×10^{-9}	5'	Lines & continuum	Evolving	Chandra, XMM, PCA	Spatially complicated
Galactic Center	6.4 keV + other lines	10^{-11} ?	Large	Fe-K line	No	Suzaku	
Perseus	Fe-K			Hot plasma	No	Suzaku	
IC443					No	Suzaku	
Cygnus Loop	0.2-2		Large	H-like lines	No	Suzaku	
Crab	4-5					PCA instrument edge	

Initial thoughts

- Redistribution and effective area are difficult to separate (contamination, CTI QEU versus redistribution)
- Redistribution has many complicated features (secondary peaks, shoulders, low energy tails)
- Need to understand source
 - Model from gratings helpful, simpler sources better?
- Missions have different needs and issues
- Can make use of GO observations, i.e. XMM MOS uses highly absorbed targets to calibrate high energy tail of redistribution
- Systematic errors in redistribution difficult to constrain