Characterization of the XSS

Introduction

Ron Elsner, Marshall Joy, Steve O'Dell,
n Sulkanen, Allyn Tennant, and Martin Weisskopf
A Marshall Space Flight Center, Space Sciences Laboratory

Robert Austin, Jeff Kolodziejczak,
Doug Swartz, and Galen Zirnstein
A Marshall Space Flight Center, Space Sciences Laboratory

Acknowledgments

all who contributed to the characterization.

personnel
ect Science (ES84 of SSL) staff
y Calibration Systems (EL71 of SAIL) staff

ersonnel
sion Support Team (MST)
n-Resolution Imager (HRI) staff
F Science Center (ASC) staff

eir perseverance and dedication (including during furloughs!),
ould not be working and these data never obtained.

Purpose of characterization

ze XSS scientific performance, at level adequate to facilitate
nd utilization.

s a function of operating parameters

al characteristics

-to-continuum ratios

profiles, widths, etc.

uniformity

ze and shape

spot size.

formation to community.

nd other data products to ASC for scientific planning

nance algorithms to TRW Test Conductor for time allocation

nformance of XSS to MSFC-SPEC 2401, “End-item specification
Ray Calibration Facility X-Ray Source System”.

Purpose of review

umenting results

adequacy and completeness of XSS characterization

actions and additional characterization needed

calibration planning

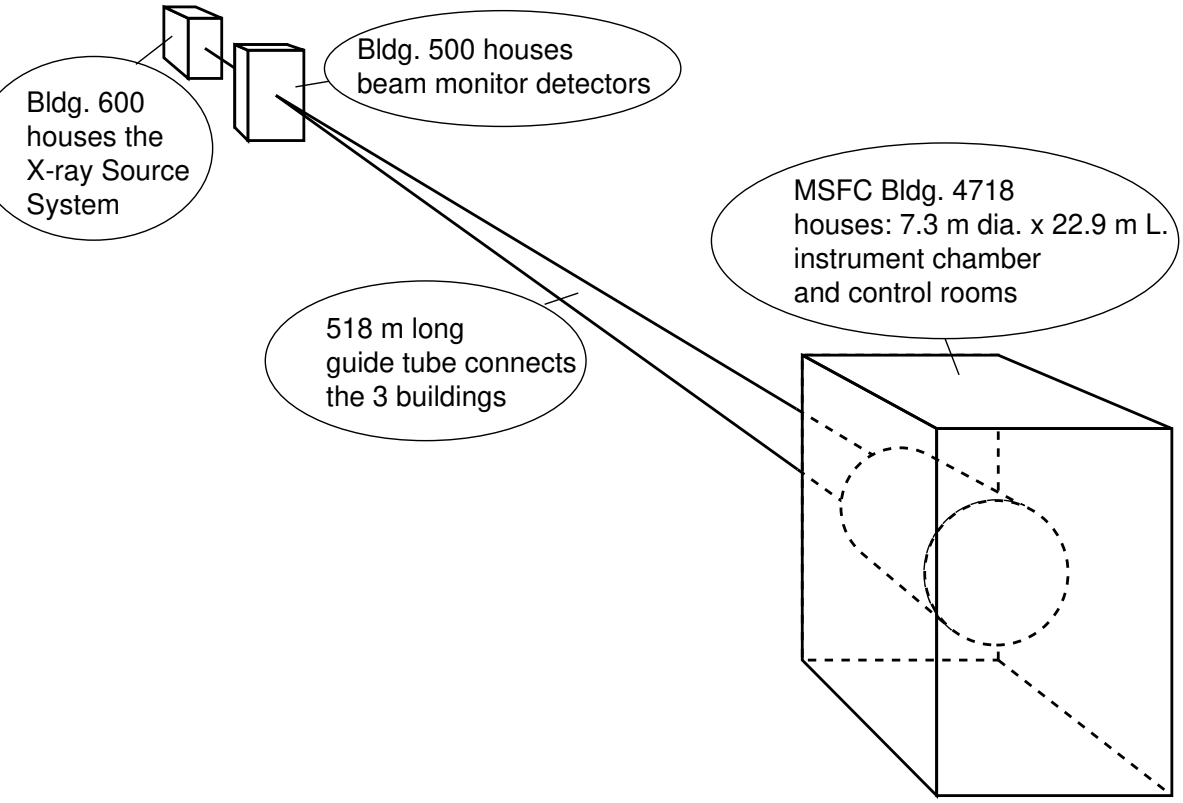
e a tutorial on XSS

lable configurations

ntific performance

be actual operational capabilities

XRCF configuration



XSS components

ces

ctron-Impact Point Source, from MSFC/EL

–HIREFS

ating-Anode Source (W or C anodes), from Rigaku

ection-grating monochromator (HIREFS® = HIgh-
olution Erect-Field Spectrometer), from Hettrick Scientific

DCM

ating-Anode Source (W anode), from Rigaku

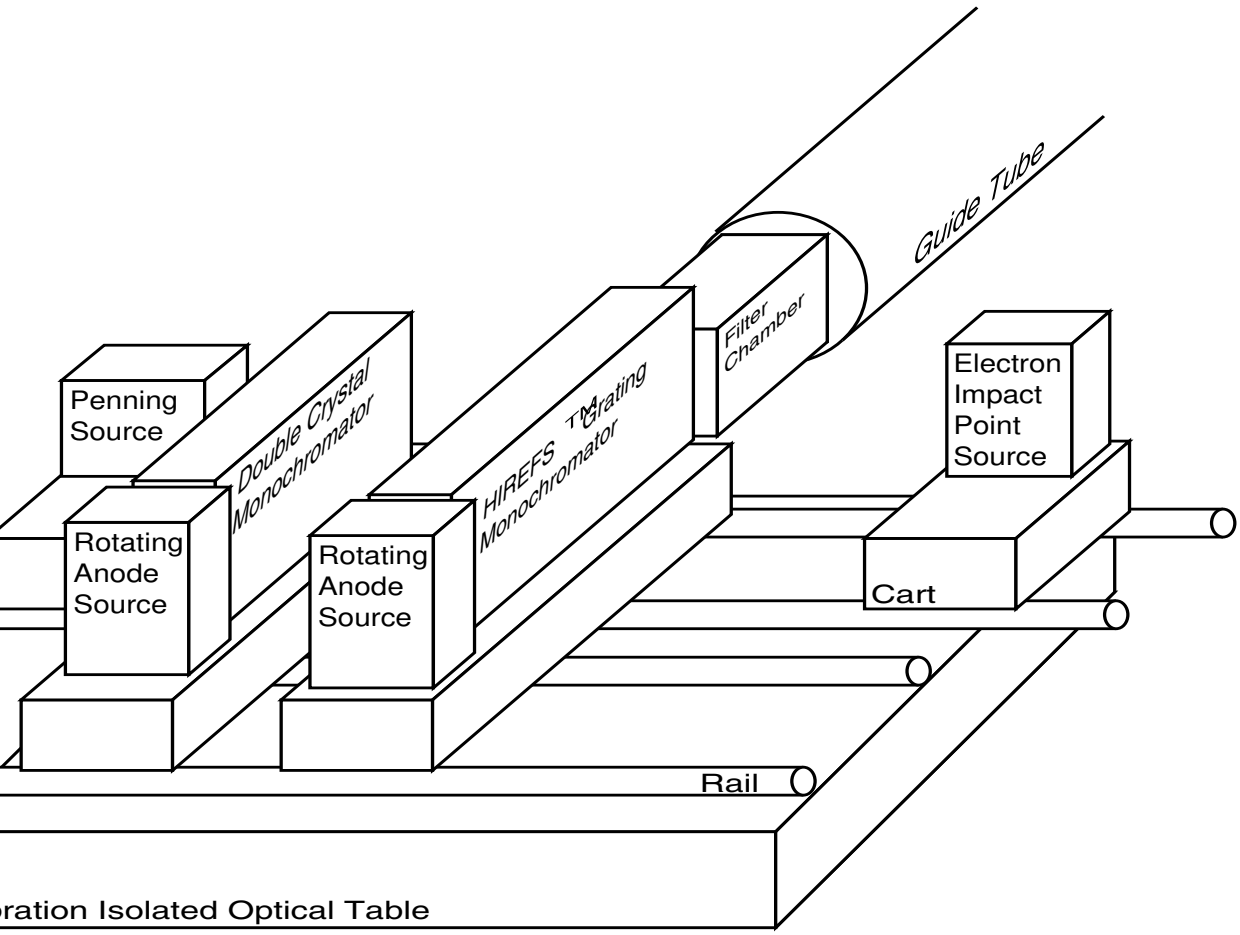
ble Crystal Monochromator (DCM), from NIST

ning Ionization Gas-discharge Source, from SAO

el Assembly (FWA)

wheels in series (filters, blanks, pinholes, occulting bars)

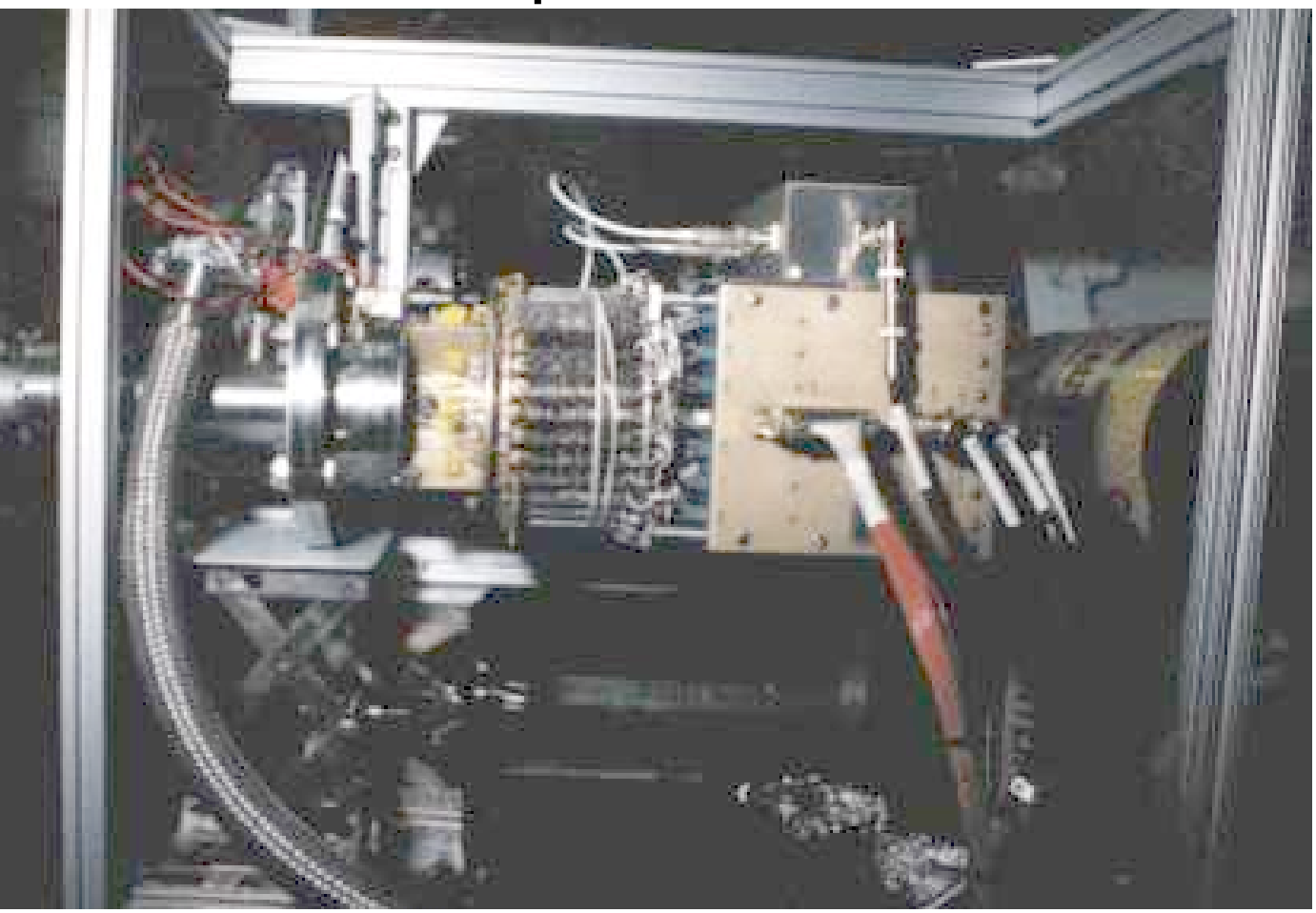
XSS configuration



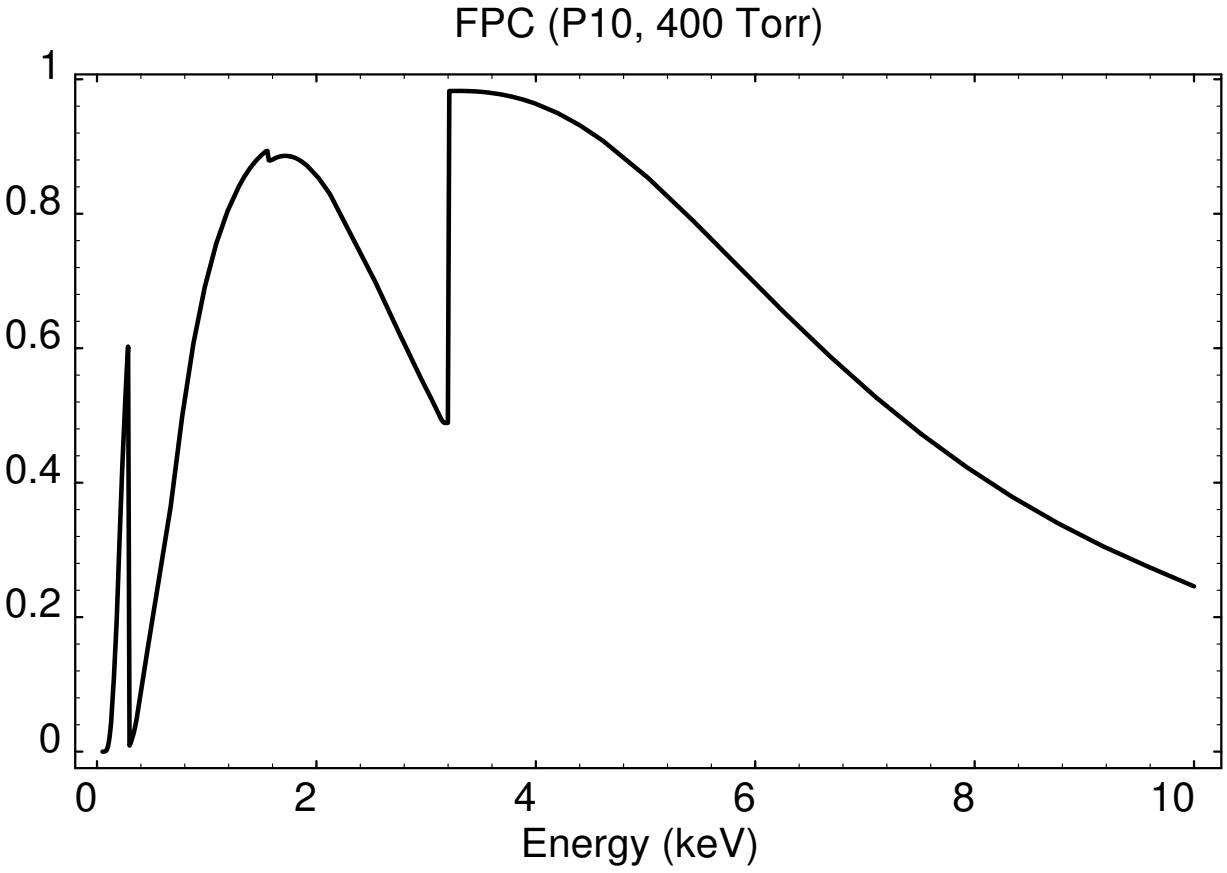
Detectors used for characterization

lution Imager (HRI), from SAO
hannel-plate detector for off-line characterization
e and direct images for measuring spot size
µm spatial precision, 25–µm spatial resolution
r for some off-line spectral characterization using the XSS
hromators
ortional counter (FPC500), from SAO
etector for on-line characterization
m (Bldg. 500) from Filter-Wheel Assembly (Bldg. 600)
ectable high voltage and apertures (P10 at 400 Torr)
s “collects” for spectral flux
cans (y or z direction) for alignment and map slices
maps (2-D raster scans) for beam uniformity
e Detector (SSD500) to be used when available

HRI photo



FPC efficiency



Continuing characterization activities

cterization is not yet complete.

is of extant XSS data will continue.

up characterization is scheduled for July.

olve ambiguities or deficiencies in data.

ain higher resolution spectrometric data with SSD500.

n XSS characterization will be published (Postscript and HTML).

d report to be completed by early August.

include data and analysis of characterization already
mplished.

eport to be completed by early October.

include data and analysis of follow-up characterization.