

Status report of B04

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and B04 team

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Keita Tanaka²⁹, Yuta Yagi²⁹

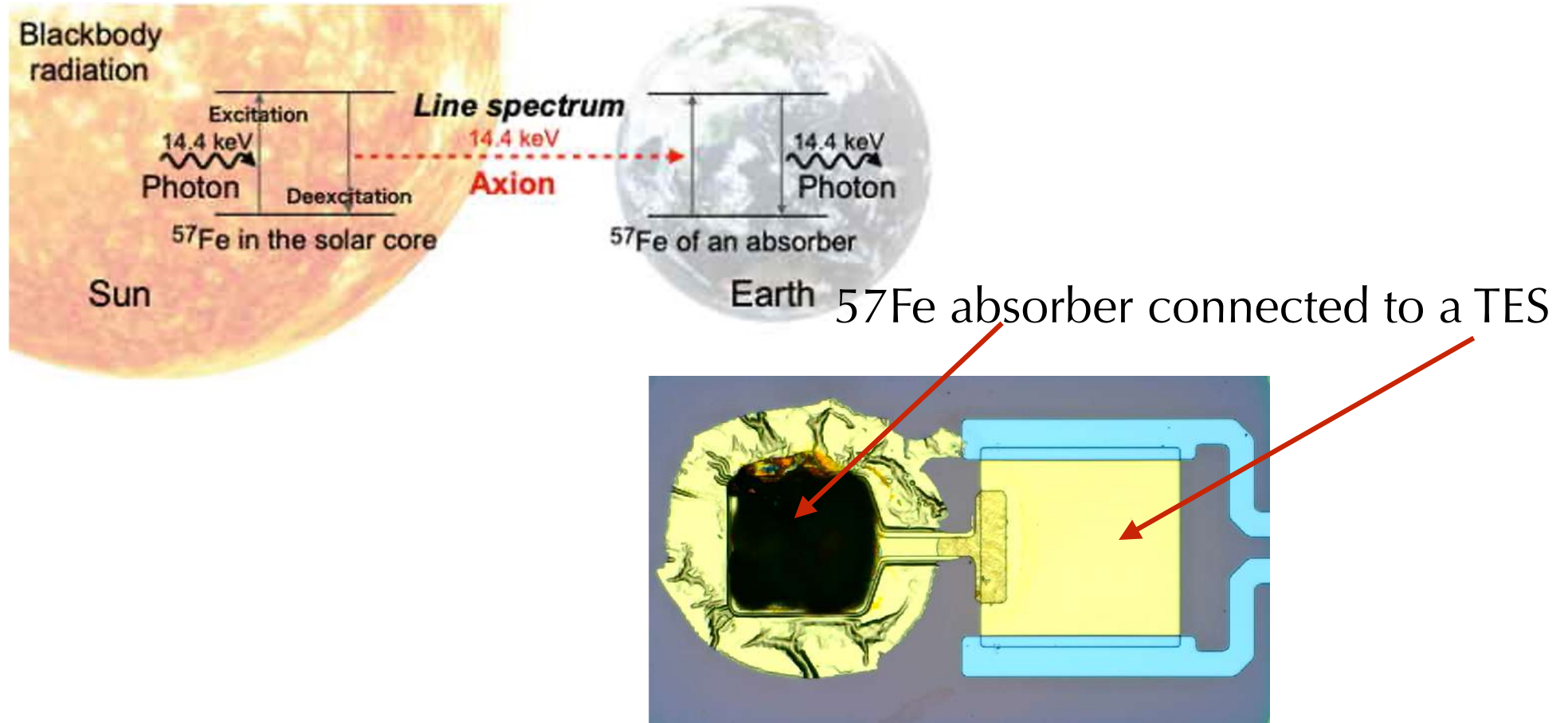
1:AIST, 2:ISAS/JAXA,3:IPMU,4:NAOJ, 5:QUP, 6:RikkyoU, 7:SaitamaU,
8:SRON,9:UTokyo

Contents

- Solar axion search experiment
 - **Test Run !** with a single pixel by Y. Yagi
 - Way forward to enlarge the area
 - Sensitivity and design of arrays by K. Tanaka
- XRISM
 - **XRISM has launched successfully and is working !**

Test run with ^{57}Fe +TES μ calorimeter

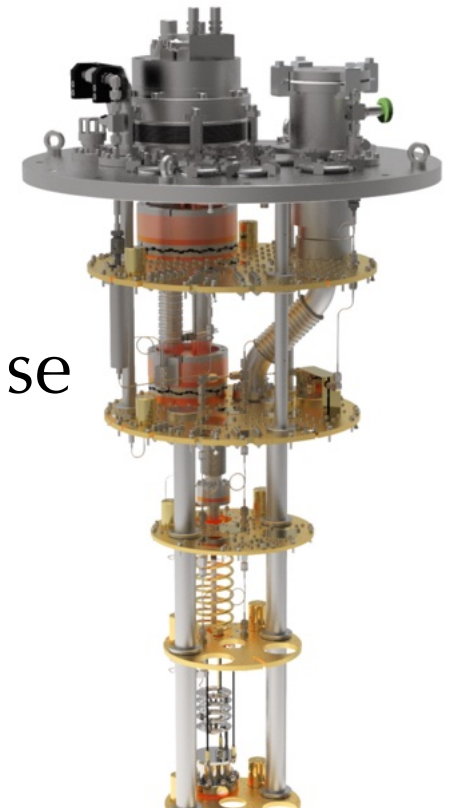
Details will be reported by Y. Yagi soon.



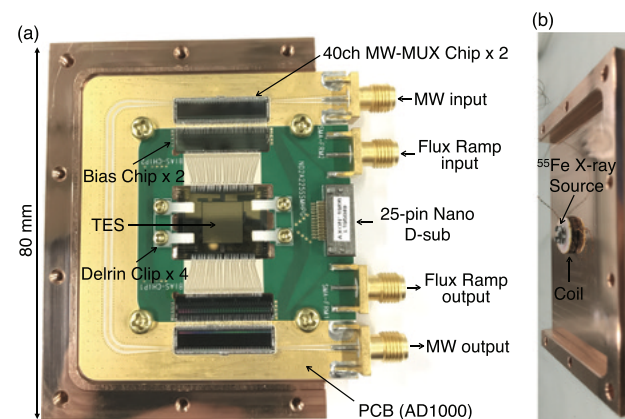
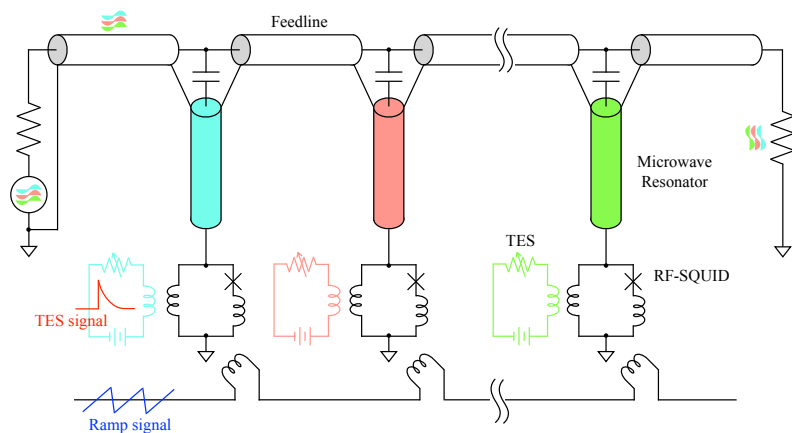
If an axion is converted to photon, it make a pulse from the TES

We want more mass !

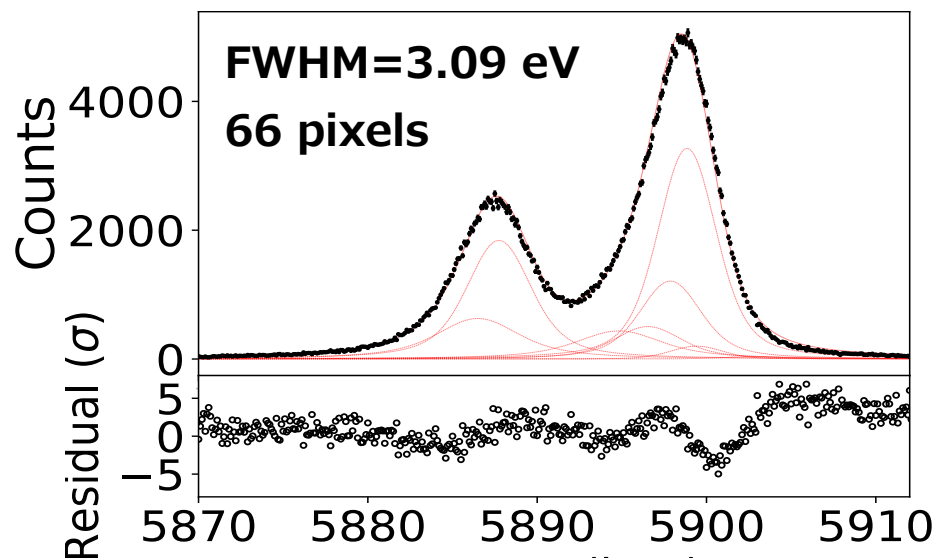
- To increase the target mass, we need an array with many TES pixels.
- Sensitivity calculation and trial to obtain the better design is shown by K. Tanaka.
- From technical point of view,
 - Development of multiplex readout
 - A new refrigerator plan
An Oxford dilution ProteoxS at QUP premise is considered. ($\phi \sim 20\text{cm}$, with coax cable)



Multiplex 38 → 66 pix simultaneously



Nakashima ph.D. thesis, Nakashima+ 2020



Kikuchi+ 2023

Now 80 pixel read-out system in 1.2 GHz BW (4.7-5.9 GHz) is working. 160-pixel in 2.4 GHz BW is under development.

⇒ 256 pix is achievable in 1 line with

4GHz BW

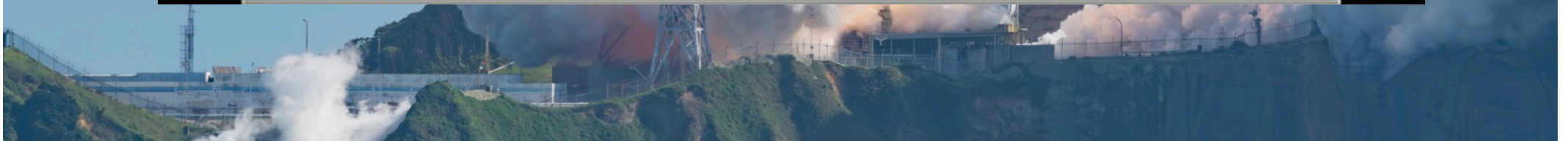
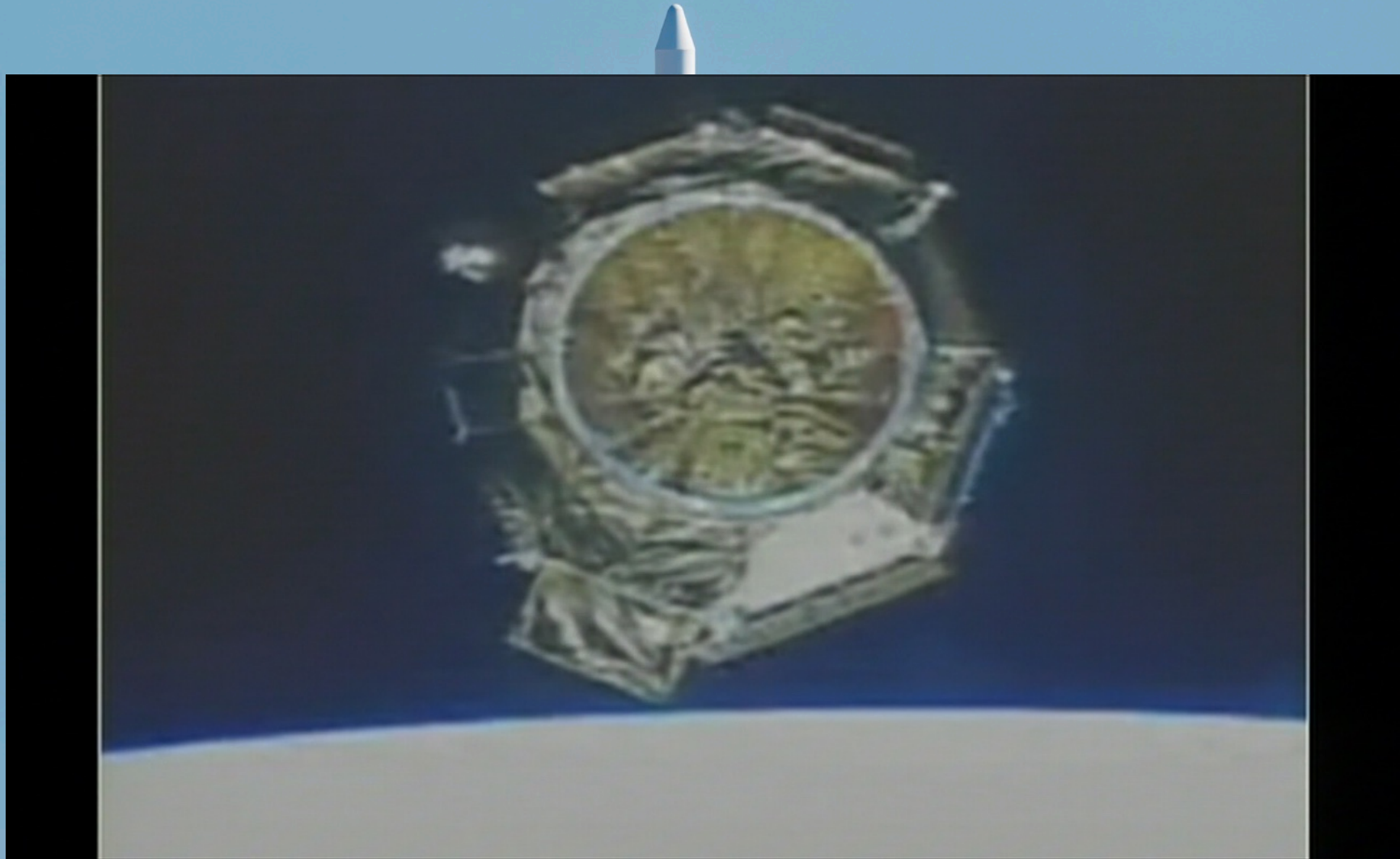
it gives ~10 mW heat load @ 4K

⇒ ~ 1000 pix is feasible within current technology

XRISM launched on Sep 7th !

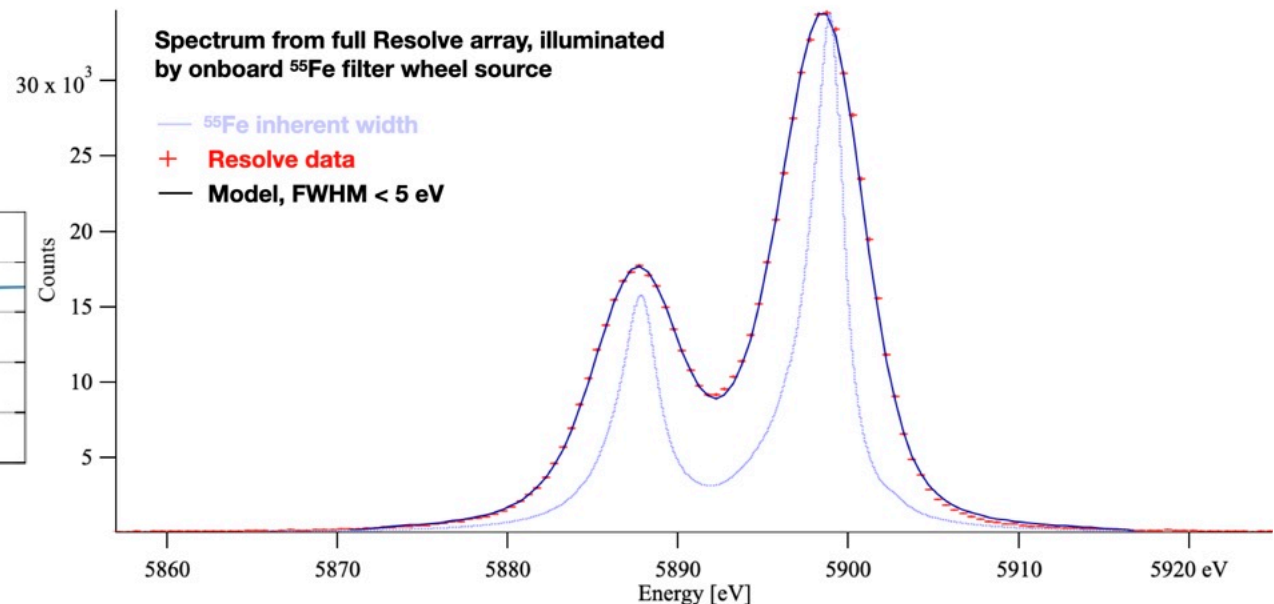
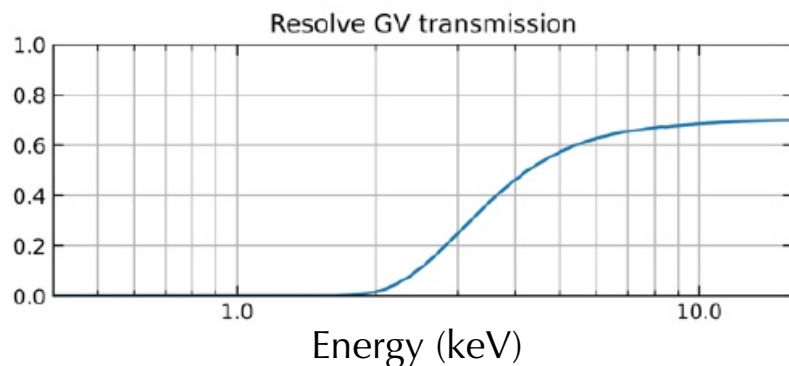


XRISM launched on Sep 7th !

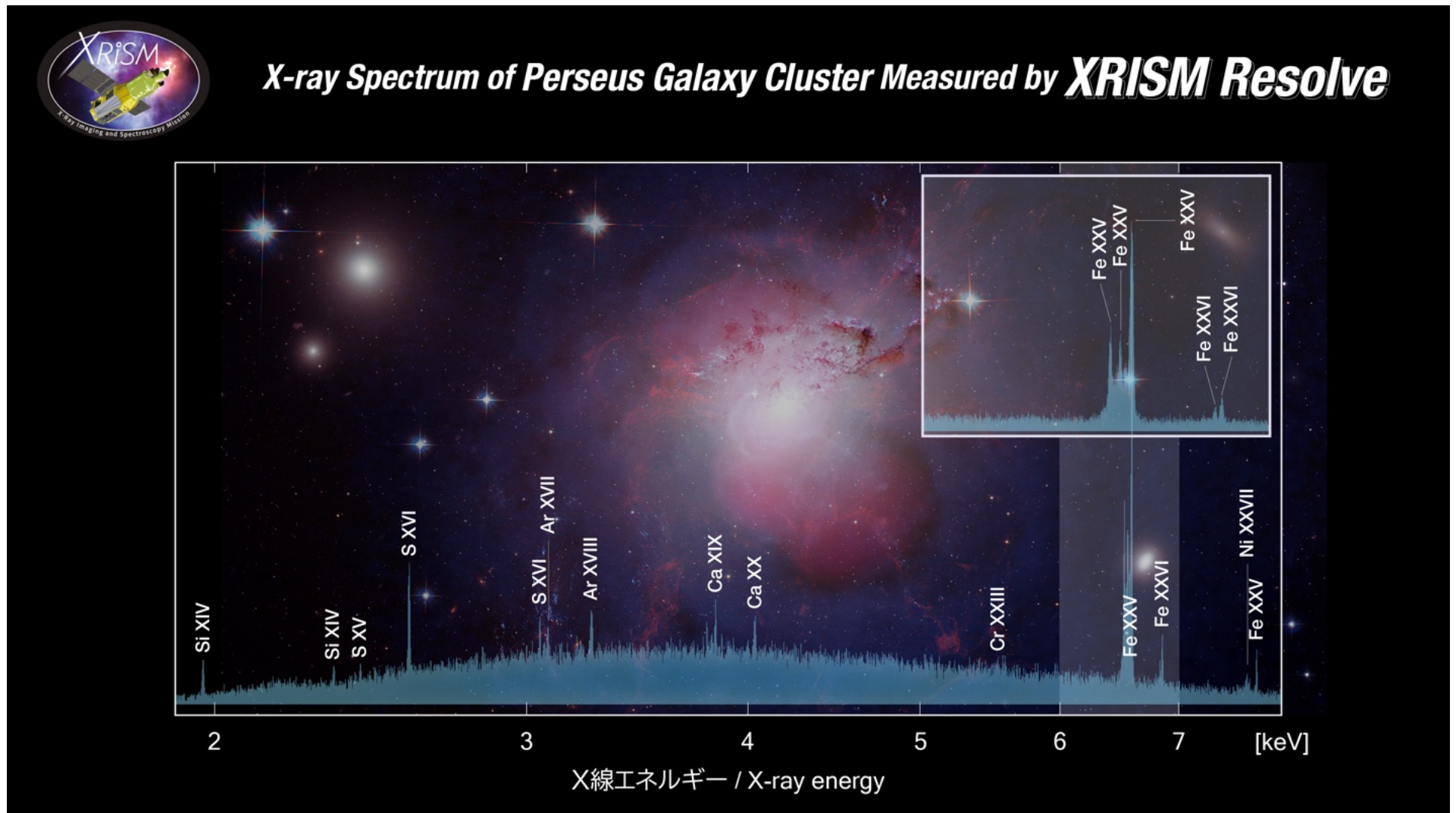


Status

- Resolve is in good condition at 50 mK with still closed GateValve. Trials are planned.
- Energy resolution is < 5 eV, and He life is expected > 4 yrs due to a very low head load.
- 2024-01-15 First Light release
- 2024-02-08 PV start (Remove some “soft” targets, increase exposure to others.)



We are back.

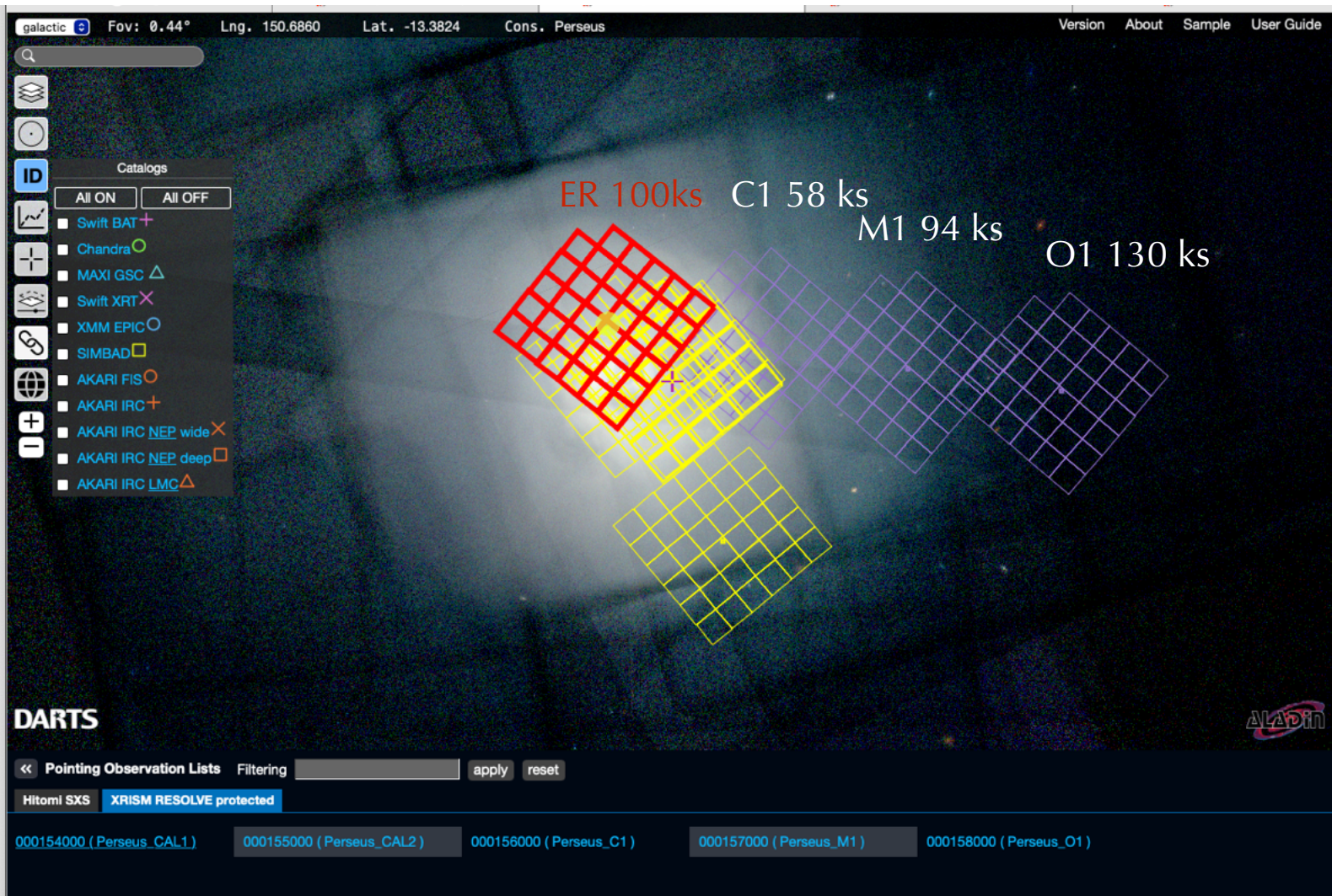


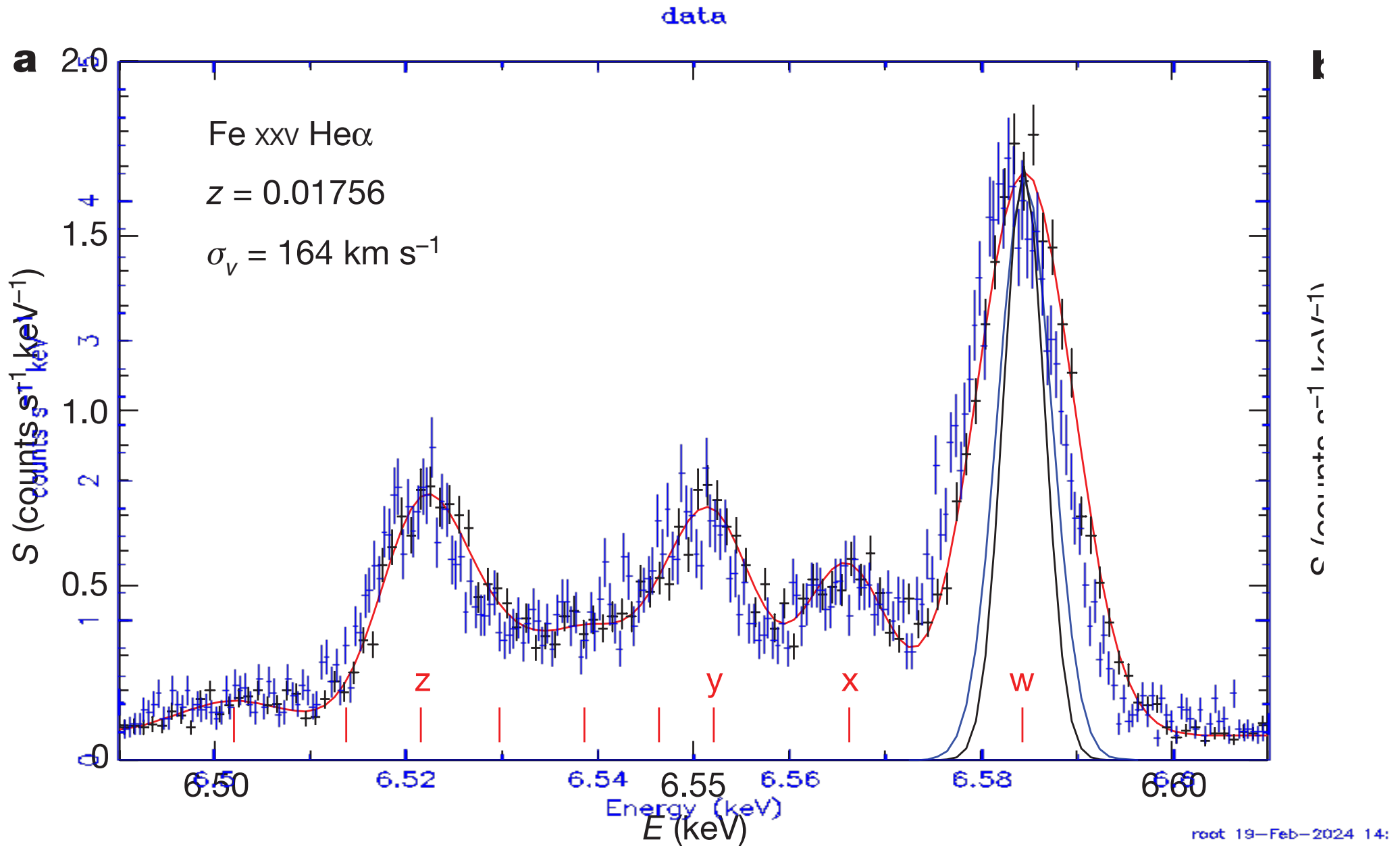
Data processing has started.

<https://www.darts.isas.jaxa.jp/astro/xrism/>

Most of data is still limited within the team, you can see logs

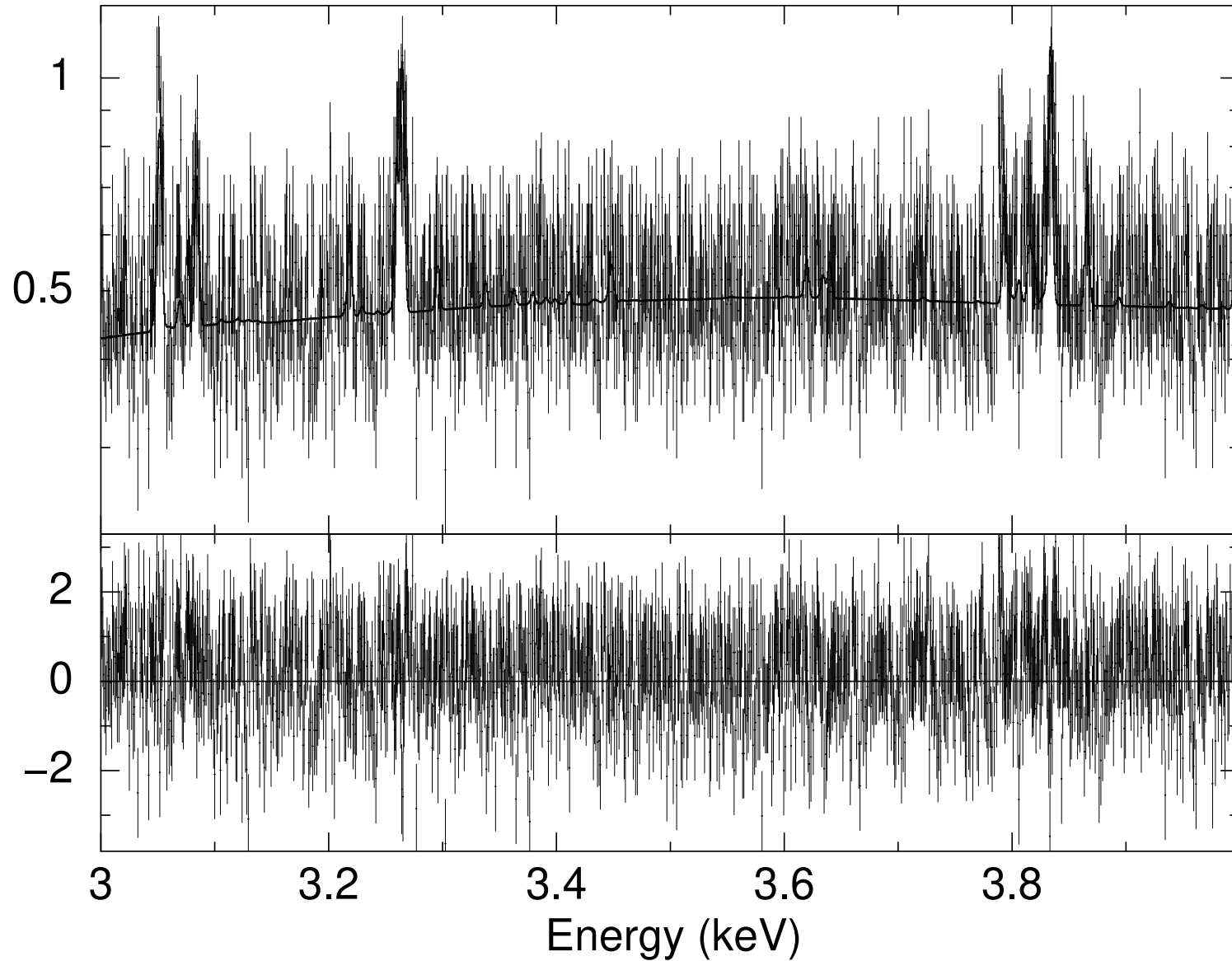
One spectrum from Perseus cluster is available as Early Release Data





Plot of **ERD (Early release data)** overlaid on Hitomi Nature paper
<https://xrism.isas.jaxa.jp/research/proposer/erd/index.html>

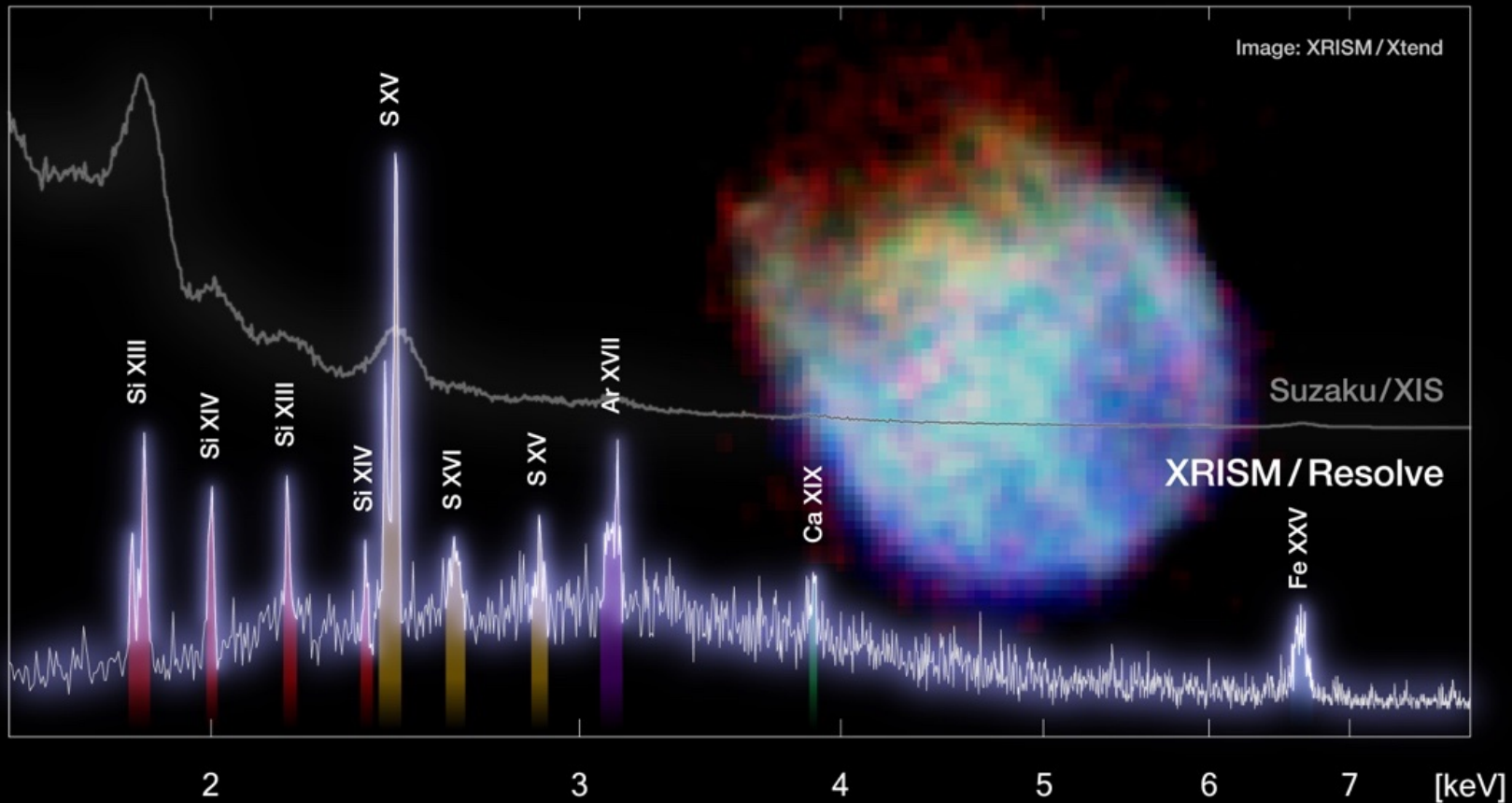
Perseus cluster by Resolve ER



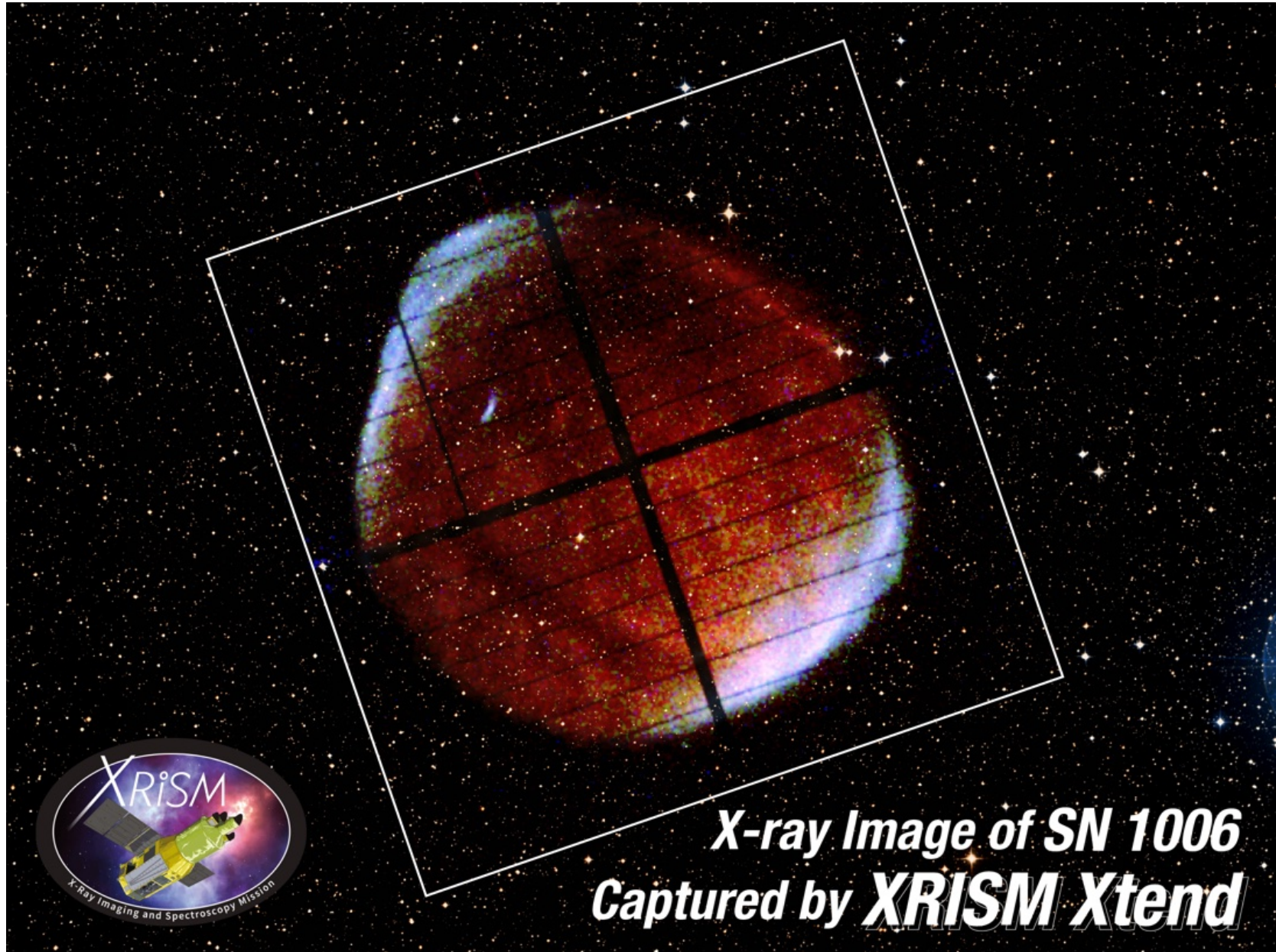
We will search DM signals with Resolve, as planned.



X-ray Spectrum of Supernova Remnant N132D Measured by XRISM Resolve

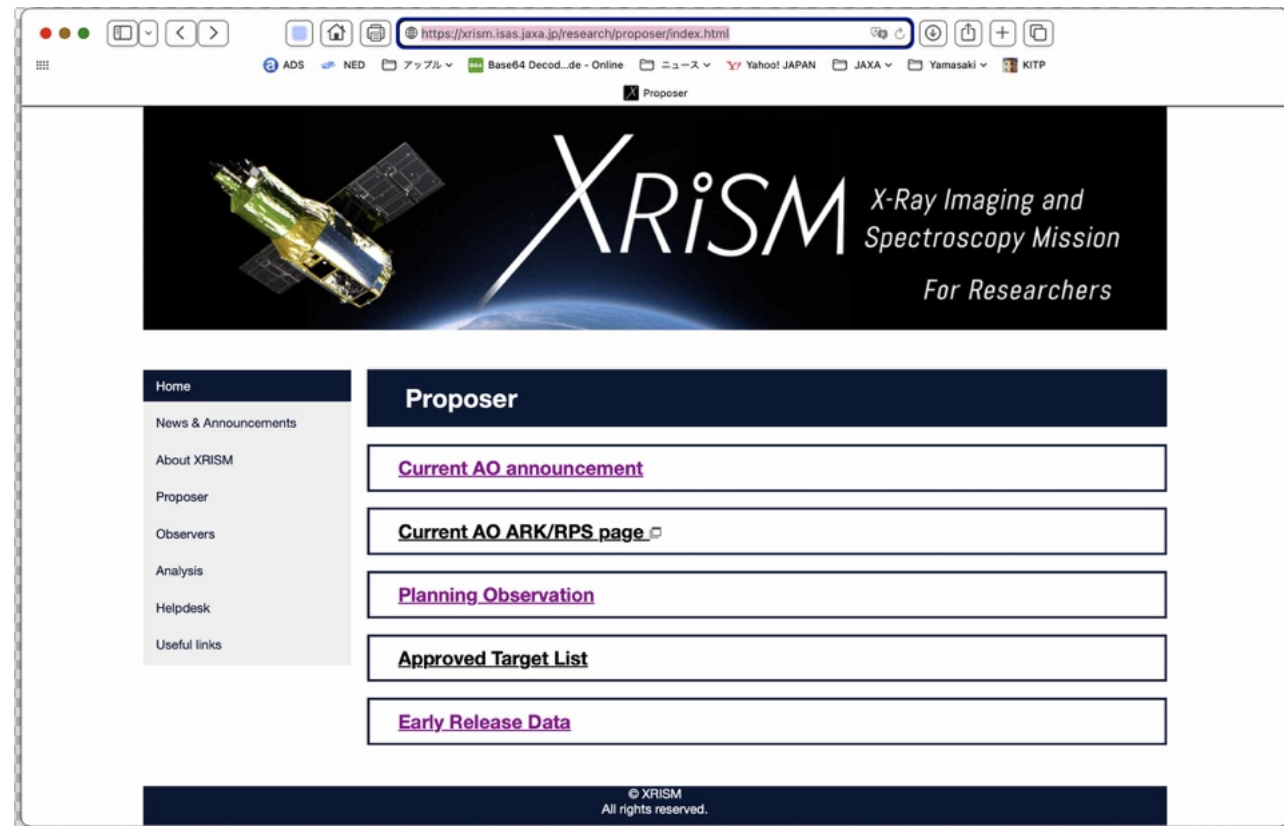


Xtend covers 38x38 arcminutes



Coming Schedule

- Deadline of GO1 proposal : Apr 4th
10-300 ksec/exposure, >600 ksec /proposal
<https://xrism.isas.jaxa.jp/research/proposer/index.html>
https://xrism.isas.jaxa.jp/research/proposer/announcement/XRISM_GO1.pdf
- GO1 will start around August



If you have an idea to search for DM or something new,
please let us know and collaborate !