

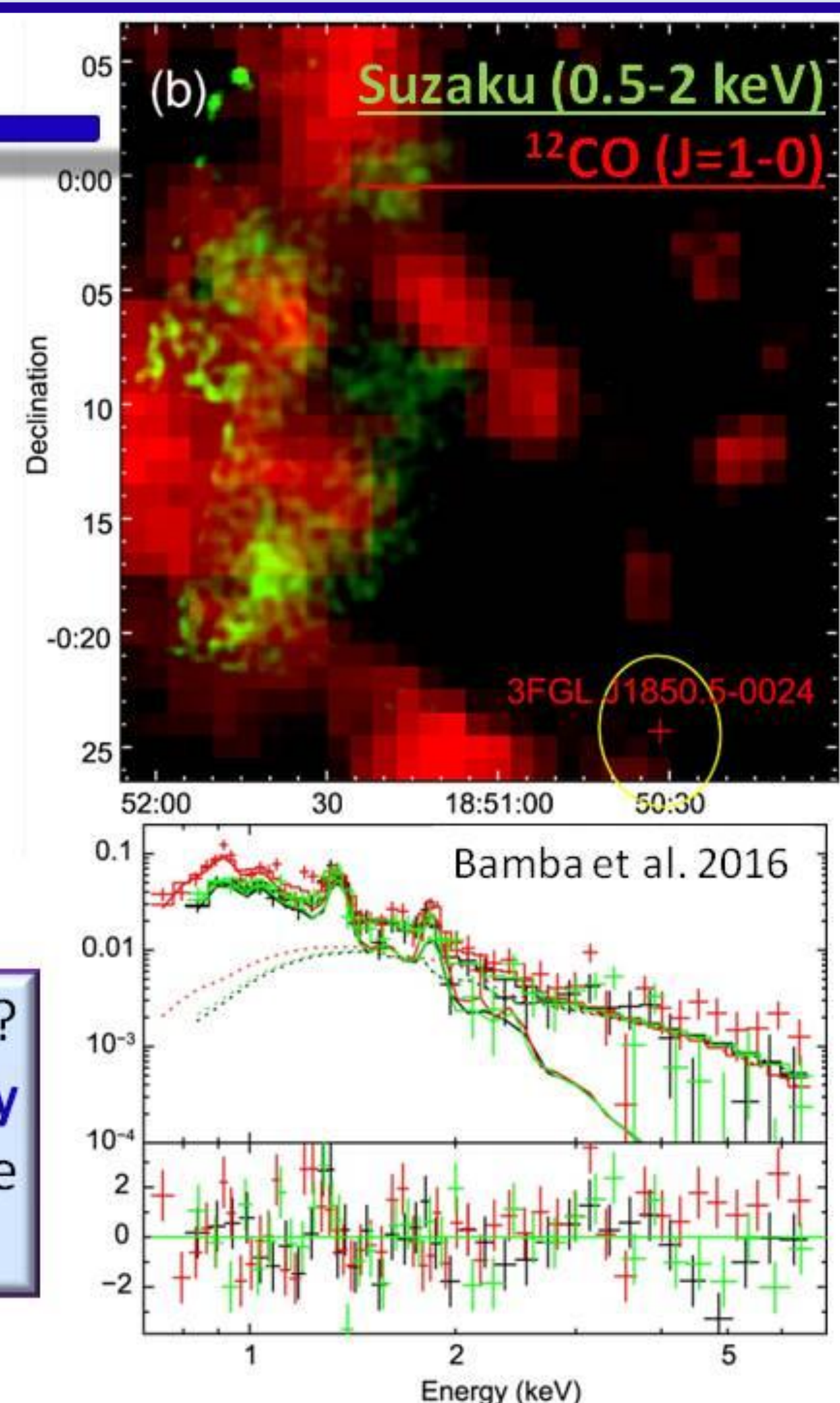
Investigating the galactic SNR Kes 78 with XMM-Newton

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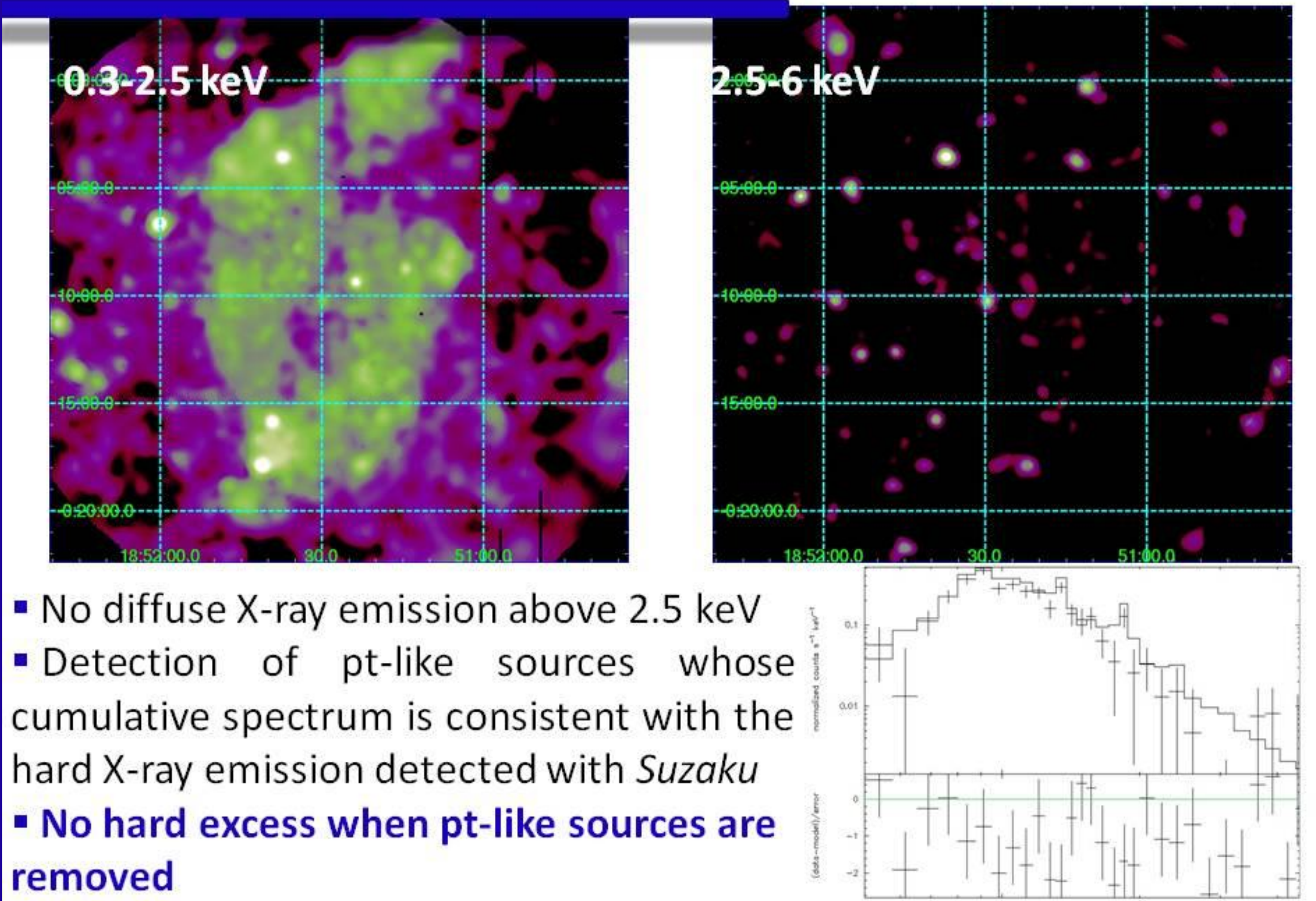
1 The SNR Kes 78

- OH masers (Green et al. 1997), suggest **interaction with a molecular cloud** (Koralesky et al. 1998, Zhou & Chen 2007, 2011)
- Close to the extended source HESS J1852-000 (Kosack et al. 2011)
- The *Suzaku* spectra show indications of hard (nonthermal?) X-rays

Is Kes 78 a cosmic ray accelerator?
What is the origin of the γ -ray emission (hadronic or Inverse Compton from hard X-rays)?

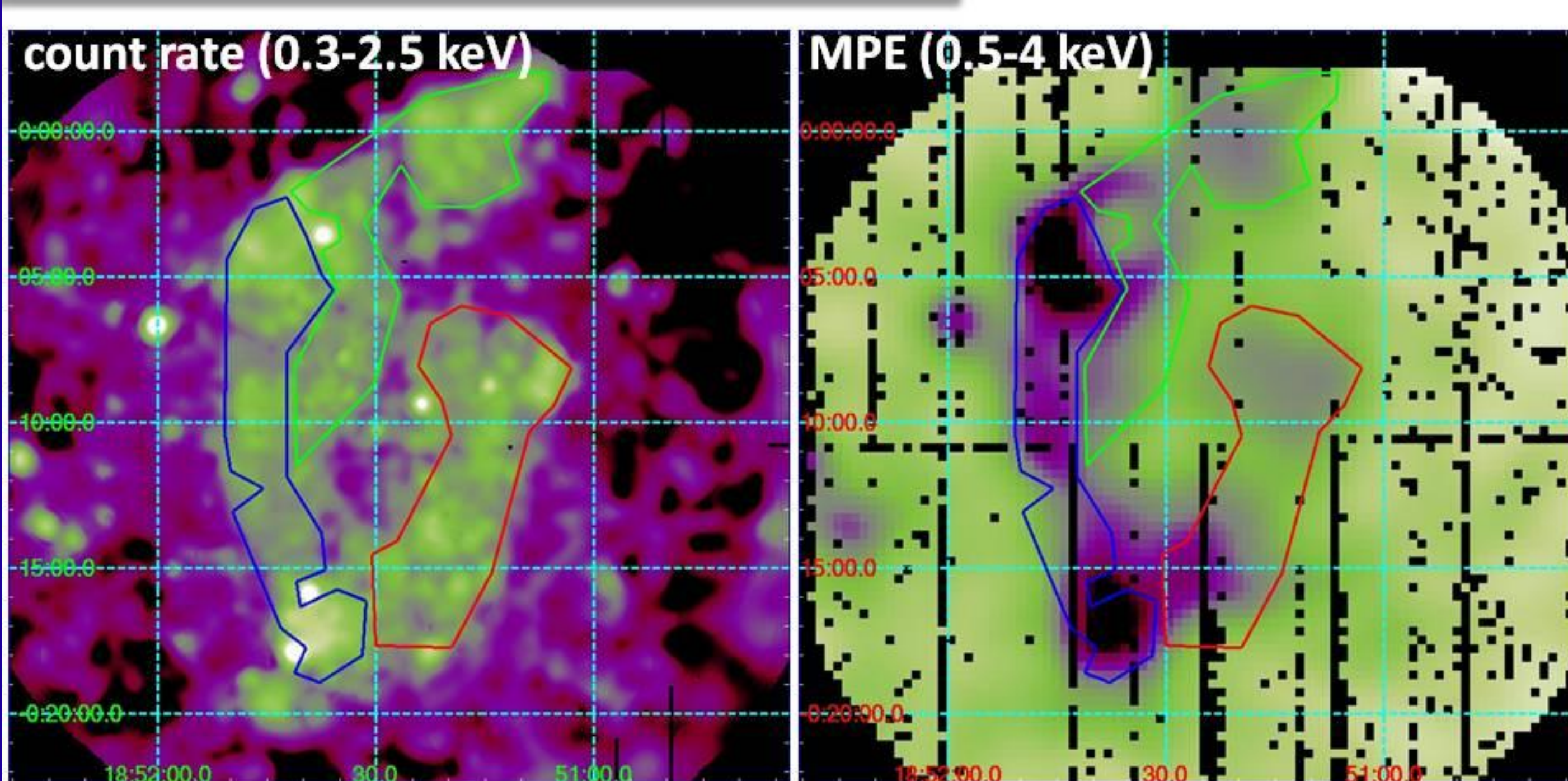


The XMM-Newton data



- No diffuse X-ray emission above 2.5 keV
- Detection of pt-like sources whose cumulative spectrum is consistent with the hard X-ray emission detected with *Suzaku*
- No hard excess when pt-like sources are removed

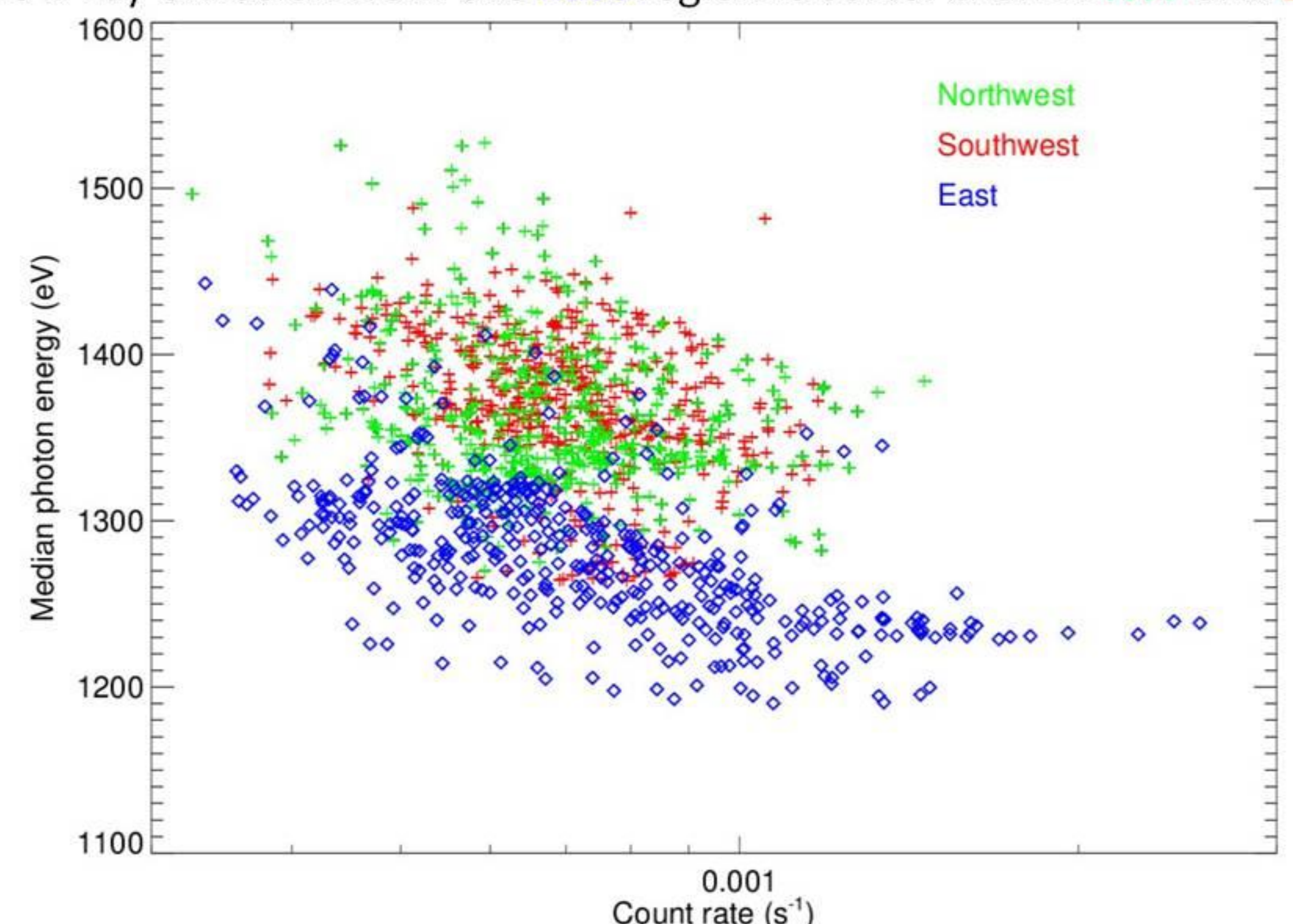
3 Median Photon Energy (MPE)



We selected a set of three regions (**East**, **Northwest** and **Southwest**, on the basis of the MPE map (where each pixel holds the median energy of the photons detected therein)

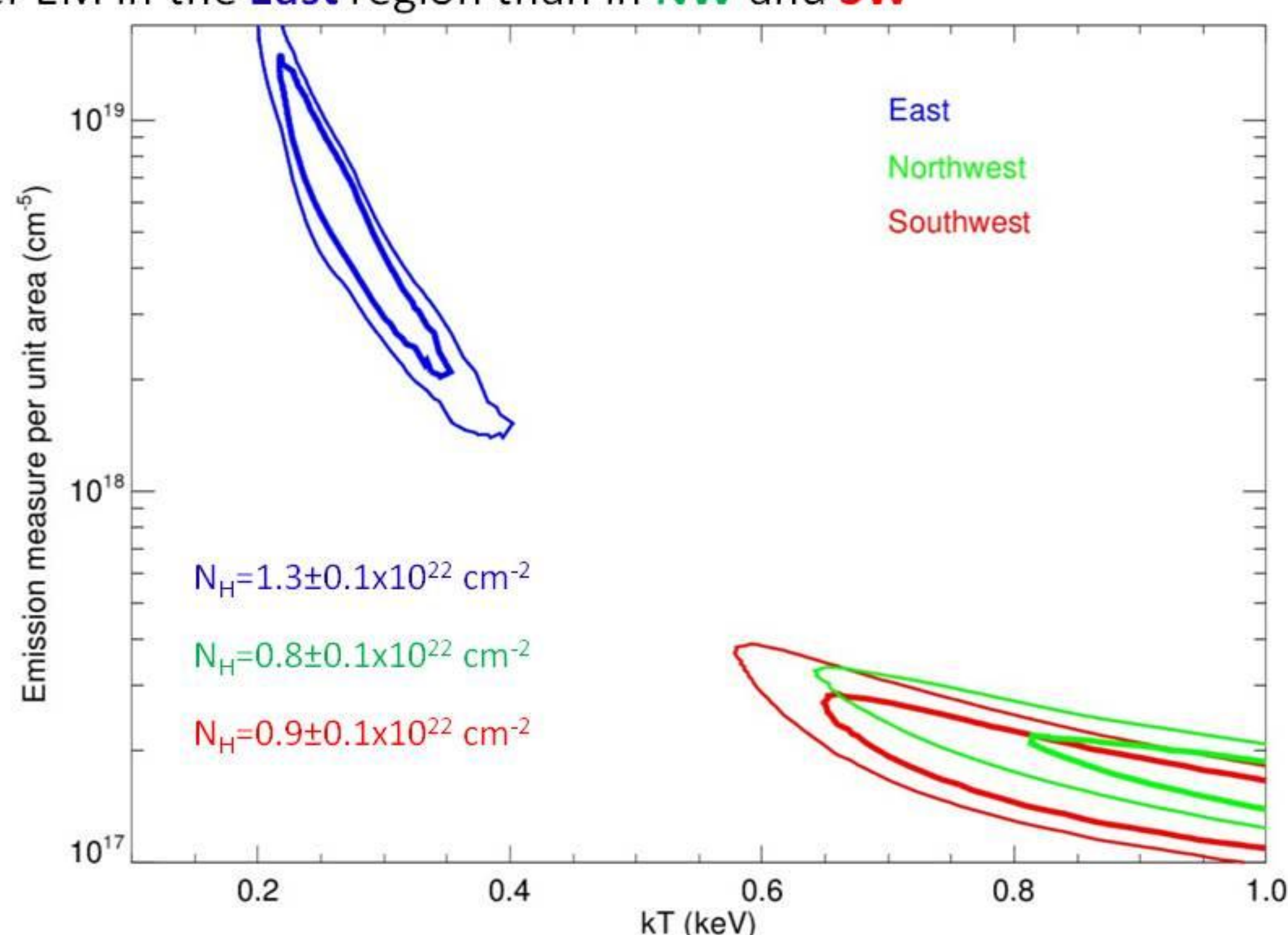
MPE vs count rate

The X-ray emission from the **East** region is softer than in **NW** and **SW**



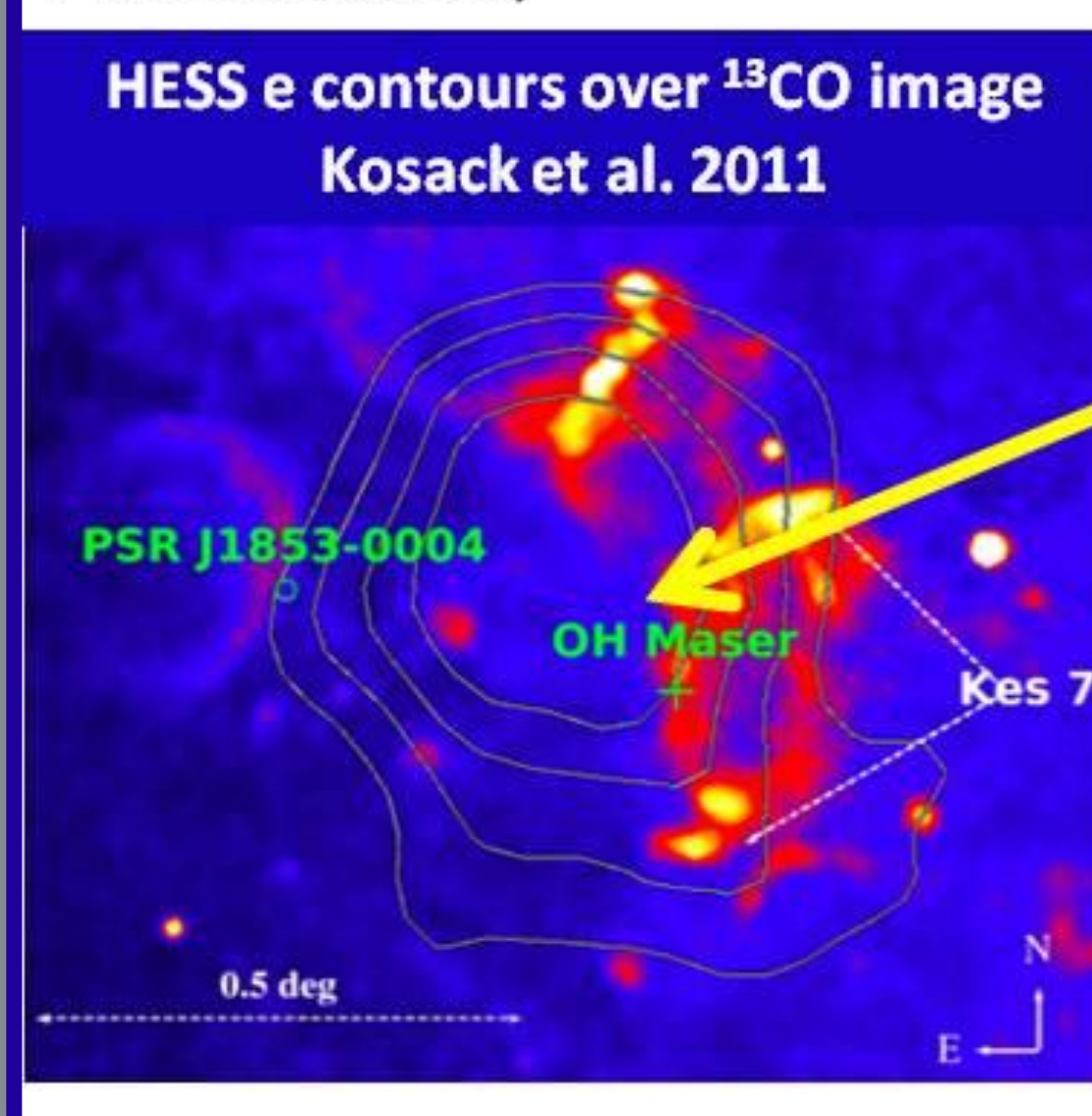
5 Spatially resolved spectral analysis

One component of optically thin plasma in NEI. Lower temperature and higher EM in the **East** region than in **NW** and **SW**



Shock-cloud interaction

Low temperature, together with high EM and N_H indicate an **interaction** with a molecular cloud in the **East** region (at the position of the HESS source)



The lack of diffuse synchrotron emission together with the signatures of shock-cloud interaction suggest a hadronic origin for the γ -ray emission