UNIVERSITÉ DE GENÈVE
FACULTÉ DES SCIENCES
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Bayesian Hierarchical Method of AGN X-ray Spectral Fitting

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i) **Full model for all sources in XXL field(~25,000);**

ii) **Applying simple model biases the parameters;**

iii) **Hierarchical prior on the flux of the powerlaw;**

iv) **Background Modelling: XB and NXB;**

i) Full Model

$$TBabs \times (zphabs \times cabs \times (zcutoffpl + q \times zbrem)$$
$$+ clumin \times apec + pexmon + f_{scatter} \times (zcutoffpl + q \times zbrem))$$
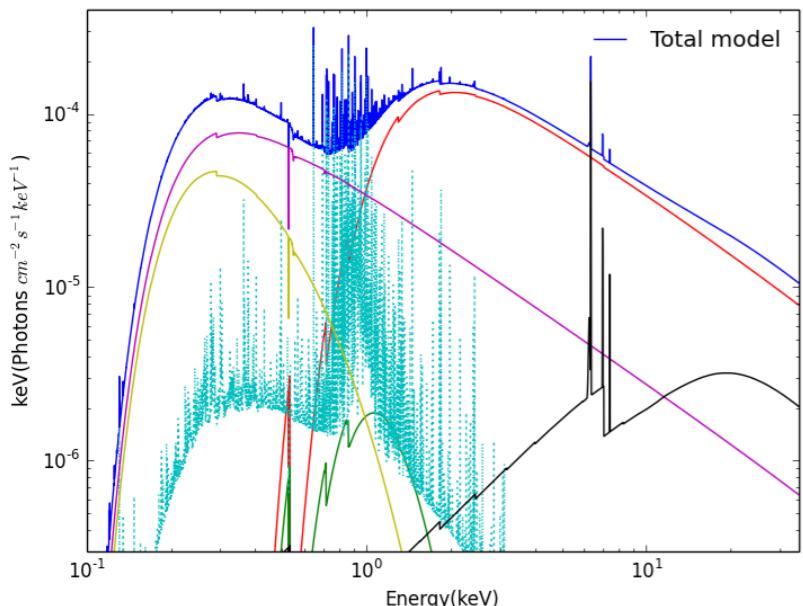
(XSPEC names)

Main components:

- **Primary Powerlaw**
- **Soft Excess (SE)**
- **Thermal Emission**
- **Reflection**
- **Scattered Powerlaw**
- **Scattered SE**

ii)

Full Model

Simple Model

N_H

Γ

True Value
Simple Model
Full Model

iii)

flux

logN-logS

Detection limit V.S. N_H

iv) Background Modelling

NXB

XB
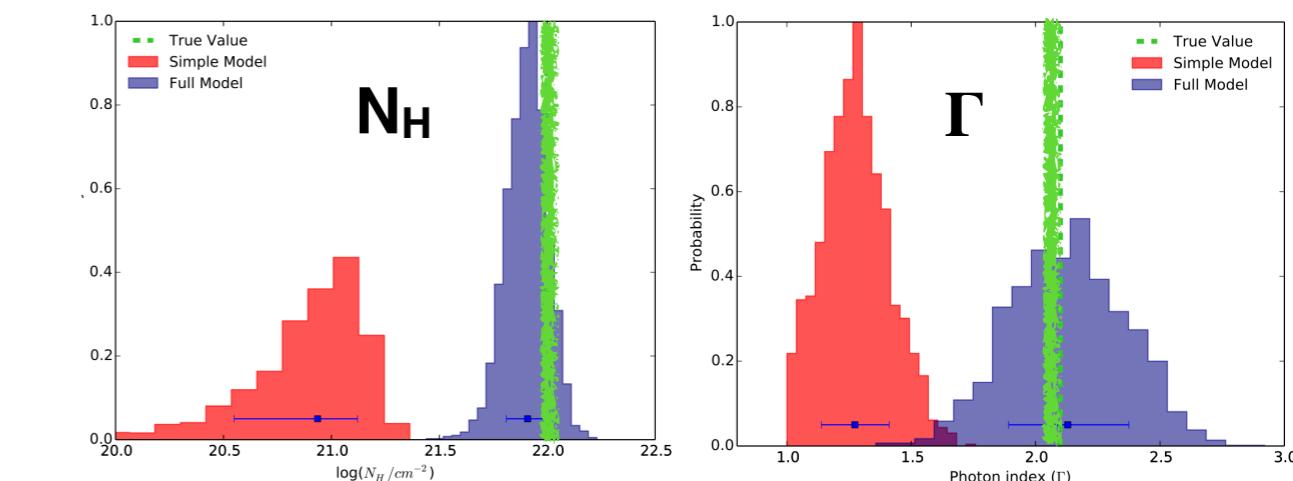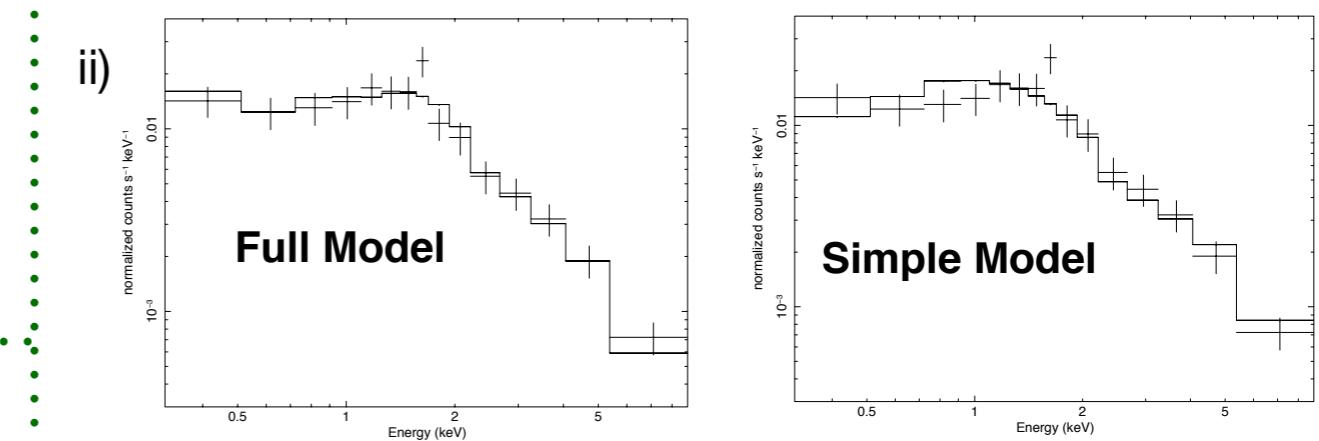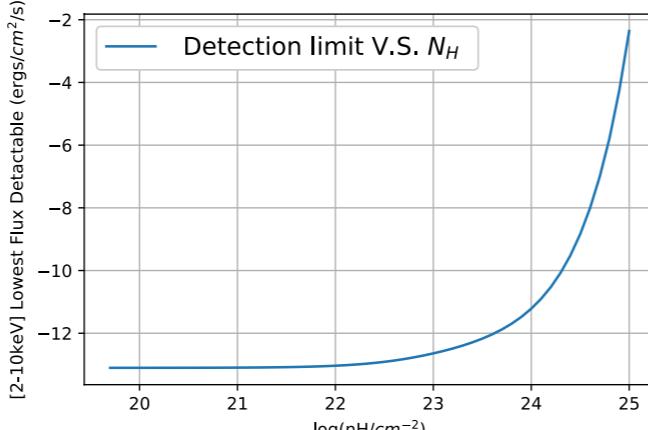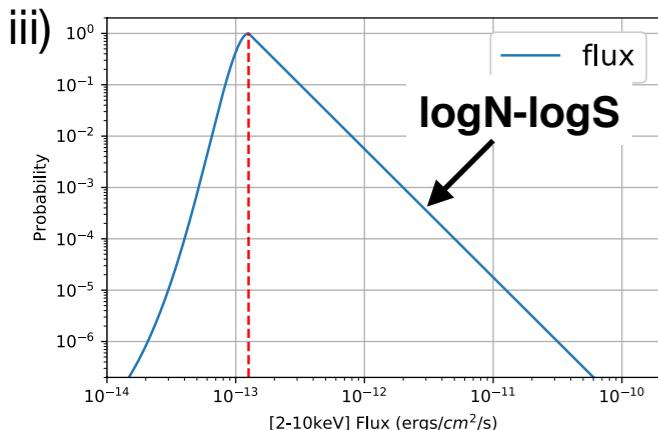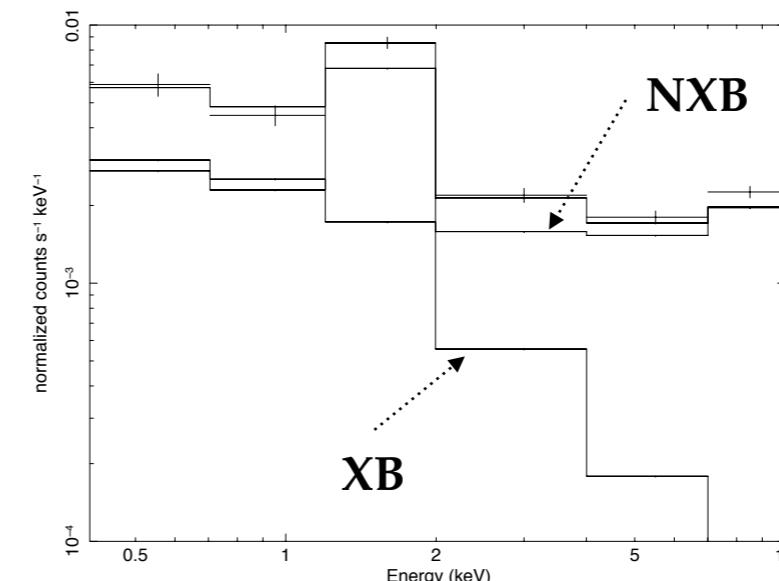
XB:

$c \times (apec + tbabs(apec + powerlaw))$

NXB:

Extracted from mosaics made for XMM

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v) Simulations

nH

PhoIndex

N_H

Γ

vi) Application to XMM-COSMOS

- **57** observations

- **XCOP** for data reduction and imaging

- Source detection done in **2-7** keV

- **860** detected

- 15 unmatched ~ **1.7%**

- Spectral extracted by **XPHOT**

- Fitted **400** with spec z
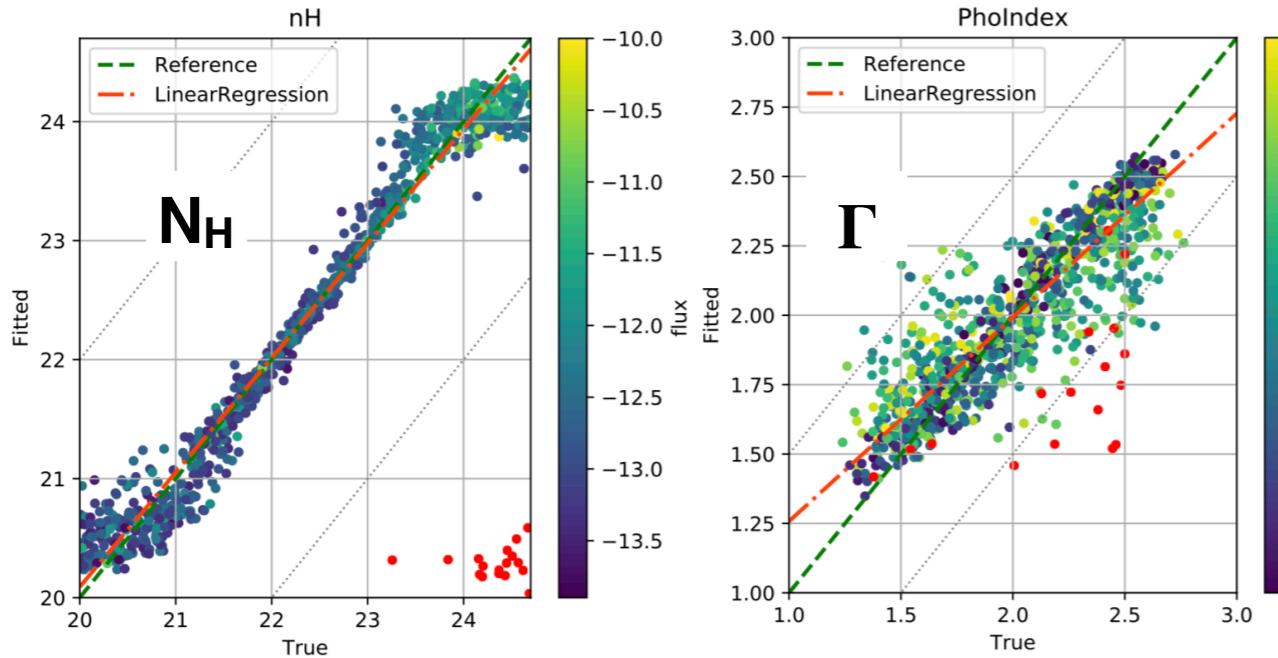
vii) Preliminary result: Obscured AGN fraction


- This work
- Ueda et al. 2014, low z
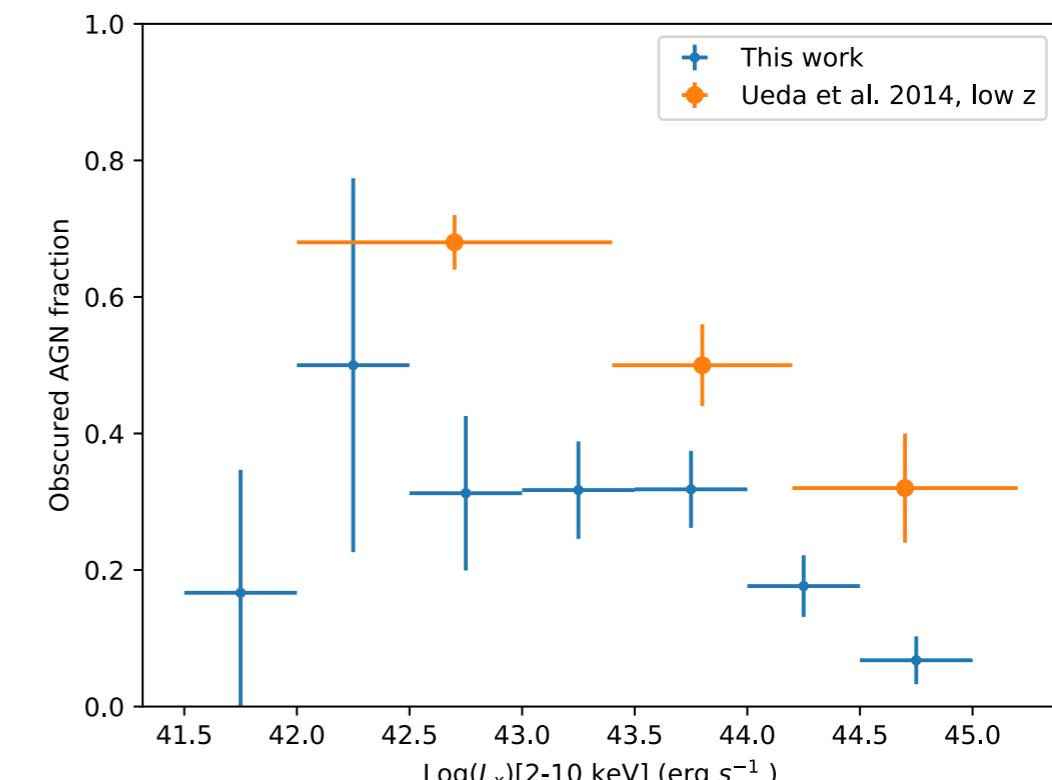
(**NOT** corrected for the selection!)

Future work

- Define **parametric distributions** (e.g., N(z), P(Nh), P(Nh|Lum), etc.);

- Fit them with a BHM;

- Determine the best parametrisation (Bayesian information criterion)

v)   Simulations for validation. Outliers around 1%;

vi)   Application to XMM-COSMOS data;

vii)   Obscured AGN fraction v.s. X-ray Luminosity