



CERTIFICATE OF ATTENDANCE

THIS IS TO CERTIFY THAT

Ms. Tímea Orsolya Kovács

ATTENDED THE EUROPEAN WEEK OF ASTRONOMY AND SPACE SCIENCE
HELD IN LIVERPOOL (UNITED KINGDOM)

On behalf of the
Scientific and Local Committees

Dr. Matt Darnley

A handwritten signature in black ink, reading 'MJ Darnley'.



Kovács Tímea <timea.kovacs95@gmail.com>

EWASS 2018 Accepted poster

EWASS 2018 <ewass2018@kuoni.com>

2018. január 11. 10:18

Válaszcím: EWASS 2018 <ewass2018@kuoni.com>

Címzett: Tímea Orsolya Kovács <timea.kovacs95@gmail.com>



Jan 11, 2018

ID 385

Dear Tímea Orsolya Kovács,

On behalf of the Scientific Committee, we are pleased to inform you that your contribution(s) below has/have been accepted for poster:

Poster Presentations

Title	The host galaxy of GRB051022
Paper Number	1319
Presentation Type	Poster
Theme	SS14 - Gamma-ray bursts, hypernovae, and superluminous supernovae: energetic cosmic explosions 20 years after SN 1998bw
Presenting Author	Ms. Tímea Orsolya Kovács Affiliations: Eötvös Loránd University
Title	Galaxies in the ELAIS N1 field
Paper Number	1339
Presentation Type	Poster
Theme	S09 - The interstellar medium as a window onto galaxy evolution
Presenting Author	Tímea Orsolya Kovács Affiliations: Eötvös Loránd University
Title	Galactic foreground of GRB051022
Paper Number	1305
Presentation Type	Poster
Theme	S09 - The interstellar medium as a window onto galaxy evolution
Presenting Author	Tímea Orsolya Kovács Affiliations: Eötvös Loránd University

We kindly invite you to inform us quickly if you do not wish to present your poster.

Poster presenters are kindly requested to follow these [instructions](#):



THE HOST GALAXY OF GRB051022

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Sarlotha Zahorecz^{5,6}, Sándor Pintér¹, Zsolt Bagoly¹, Lajos G.
Balázs^{1,2}, Yasuo Doi⁴, István I. Rácz^{1,7}

¹Eötvös Loránd University, Hungary, ²Konkoly Observatory of the Hungarian Academy of Sciences, Hungary, ³Laboratoire d'Astrophysique de Marseille, France, ⁴The University of Tokyo, Japan, ⁵National Astronomical Observatory of Japan, ⁶Osaka Prefecture University, Japan, ⁷National University of Public Service, Hungary

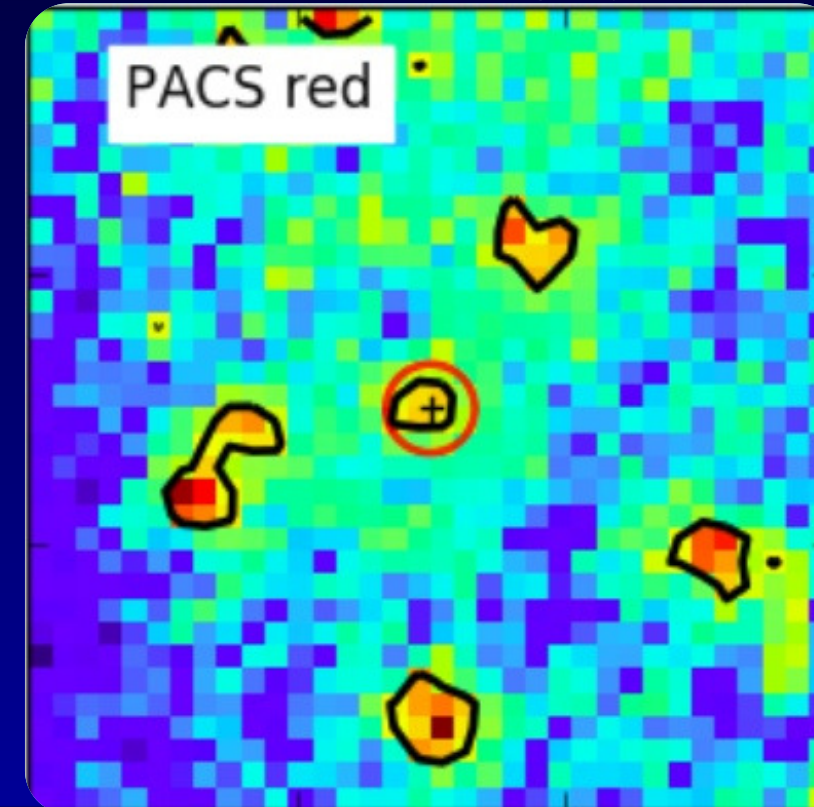
Introduction

GRB051022 is a well known long gamma ray burst (LGRB), with a $T_{90} = 200$ s, at $z = 0.807$. LGRBs are emitted at the end of the lifetime of massive stars. This suggests that the host galaxies are active in star formation. The dust around young stars absorbs their radiation and reemits it in the infrared. So we use Herschel data to estimate the star formation rate.

Methods

We used the SED fitting code CIGALE (Noll+2009, Roehlly+2014). The program fits the SED from the UV to the radio, and different models can be chosen for the various mediums and physical processes in galaxies.

We used the Bruzual and Charlot Simple Stellar Population models, a delayed star formation history with an exponential burst, the Drain and Li model for the dust emission, and a double powerlaw for the attenuation.



160 μ m
Herschel PACS map,
with the source
at the center.

Used data

We performed photometry on Herschel SPIRE and PACS maps with different methods, to obtain good estimates of the far infrared flux so we can constrain star formation. Photometric data at different wavelengths was also collected from VIZIER and articles.

The Giant GRB ring

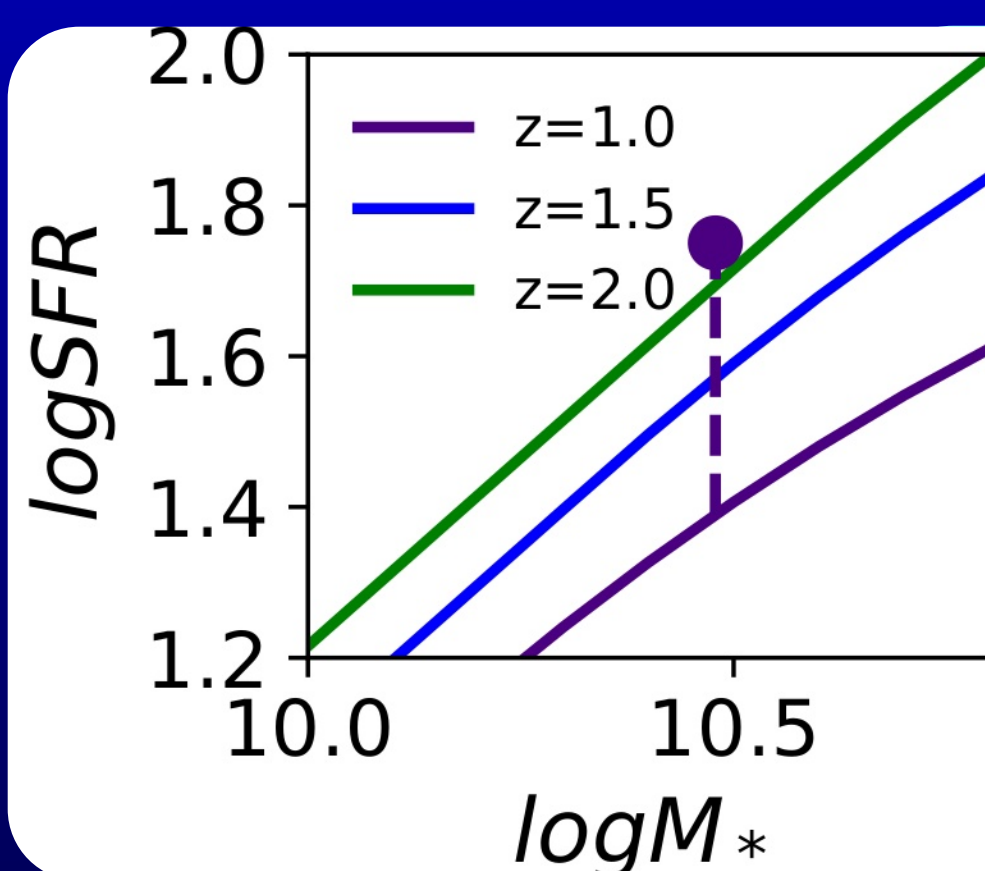
GRB051022 is part of the Ring GRBs: an overdensity of GRBs consisting of 9 GRBs in a redshift range of $z = 0.76$ to 0.86 . (Balázs +2018) The ring has a similar shape to Australia, GRB051022 corresponds to Melbourne.

Results

SFR = 56.3 M/yr is higher, than previous SED fittings, but close to results from spectral lines (HB). The main difference is probably in the used models (Hunt+2014, Savaglio+2009, Hatsukade+2014).

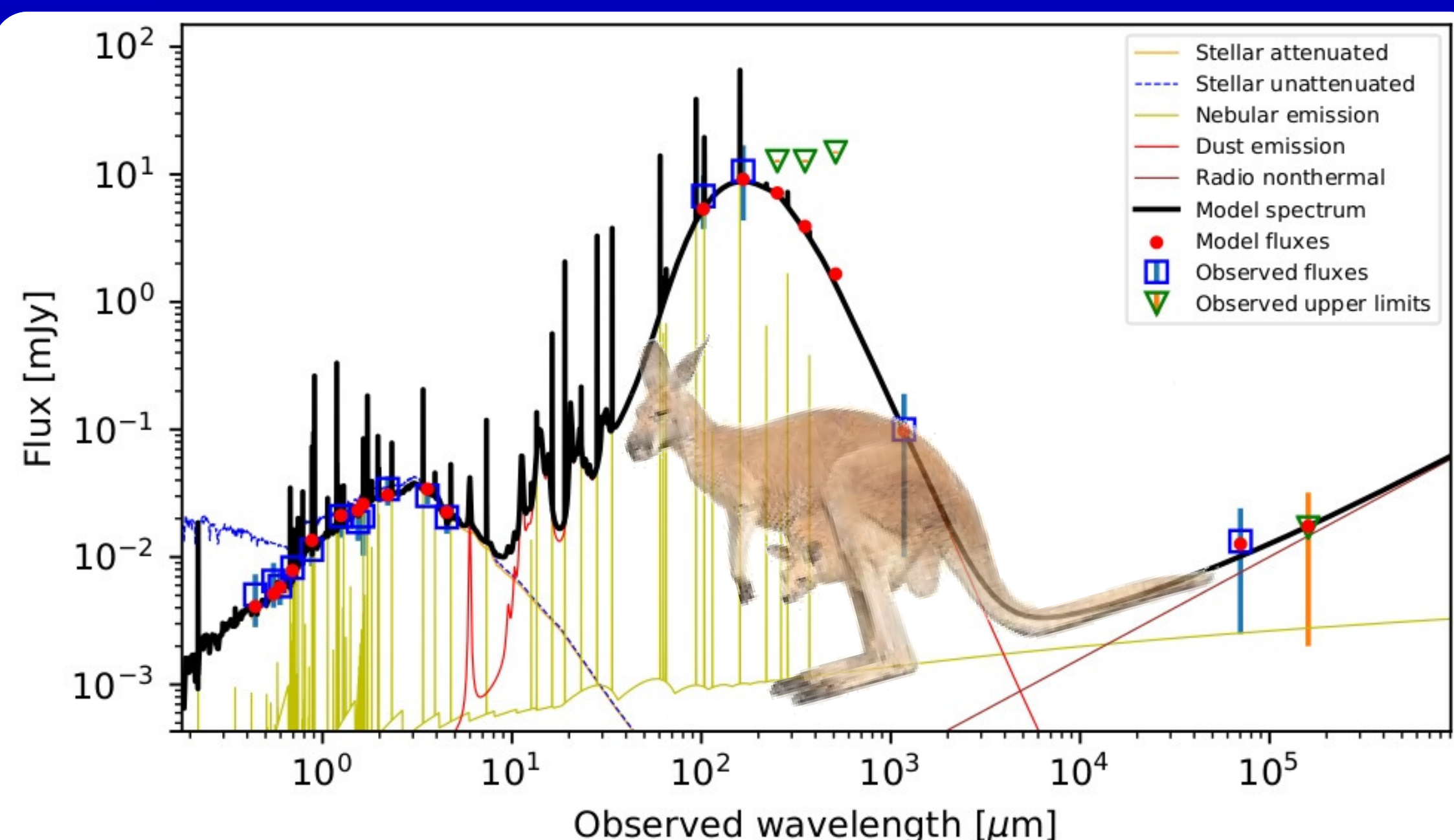
The SFR is 3 times higher than expected from the main sequence of galaxies, indicating it is a starburst.

The other parameters are consistent with the literature: the host is a massive, luminous galaxy.



The position of the galaxy on the main sequence of galaxies (Schreiber+2015).

The star formation rate is higher at higher redshift and larger stellar mass.



The Spectral Energy Distribution of the host galaxy of GRB051022. We determined the stellar mass, star formation rate (SFR), dust mass and luminosity.

Star formation rates
from the literature

SED (UV)	4.8
SED (IR)	17.9
IR SED	36
OII	36.5
HB	58.2

Acknowledgements:

Supported by the ÚNKP61762 New National Excellence Program of the Ministry of Human capacities, and the OTKA NN6111016 grant.

References:

Roehlly, Y. et al, 2014, ASPC, 485, 347R
Hunt, L. K. et al, 2014, A&A, 565A, 112H
Savaglio, S. et al, 2009, ApJ, 691, 182S
Hatsukade, B. et al, 2014, Nature, 510, 247H
Schreiber, C. et al, 2015, A&A, 575A, 74S
Balázs, Lajos G. et al, 2015, MNRAS, 452, 2236
Balázs, Lajos G. et al, 2018, MNRAS, 473, 3169B
Noll, S. et al, 2009, A&A, 507, 1793N

Galaxies in the ELAIS N1 field



Tímea Orsolya Kovács¹, Sándor Pintér¹ L. Viktor Tóth^{1,2}, Nofoz Suleiman¹, Zsolt Bagoly¹, Lajos G. Balázs^{1,2}, Denis Burgarella³, Yasuo Doi⁴, István I. Rácz^{1,7}, Sarolta Zahorecz^{5,6}

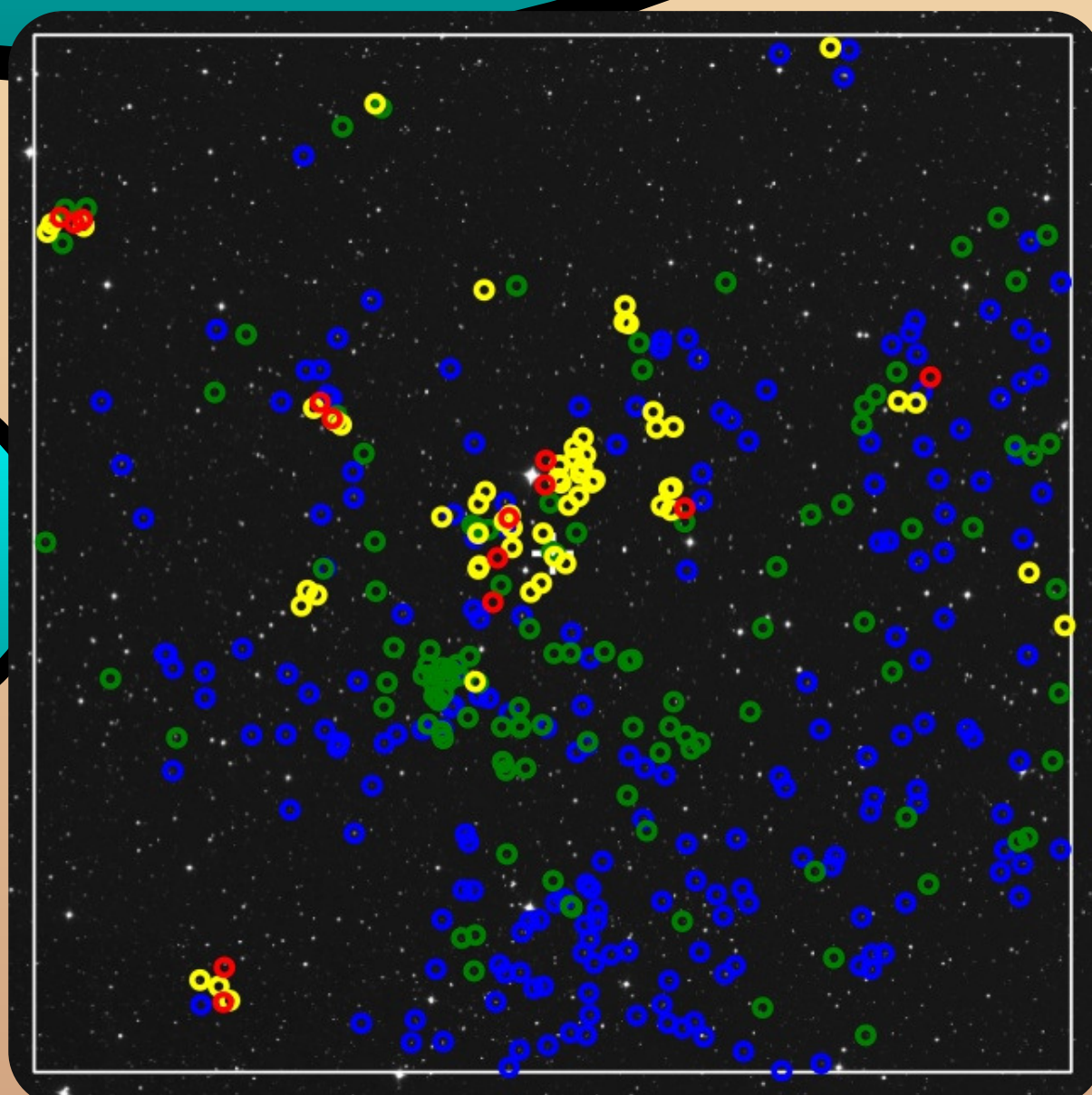
¹Eötvös Loránd University, Hungary, ²Konkoly Observatory of the Hungarian Academy of Sciences, Hungary, ³Laboratoire d'Astrophysique de Marseille, France, ⁴The University of Tokyo, Japan, ⁵National Astronomical Observatory of Japan, ⁶Osaka Prefecture University, Japan, ⁷National University of Public Service, Hungary

Introduction

The ELAIS N1 field was among the regions observed in one of ISO's (Infrared Space Observatory) biggest open time project.

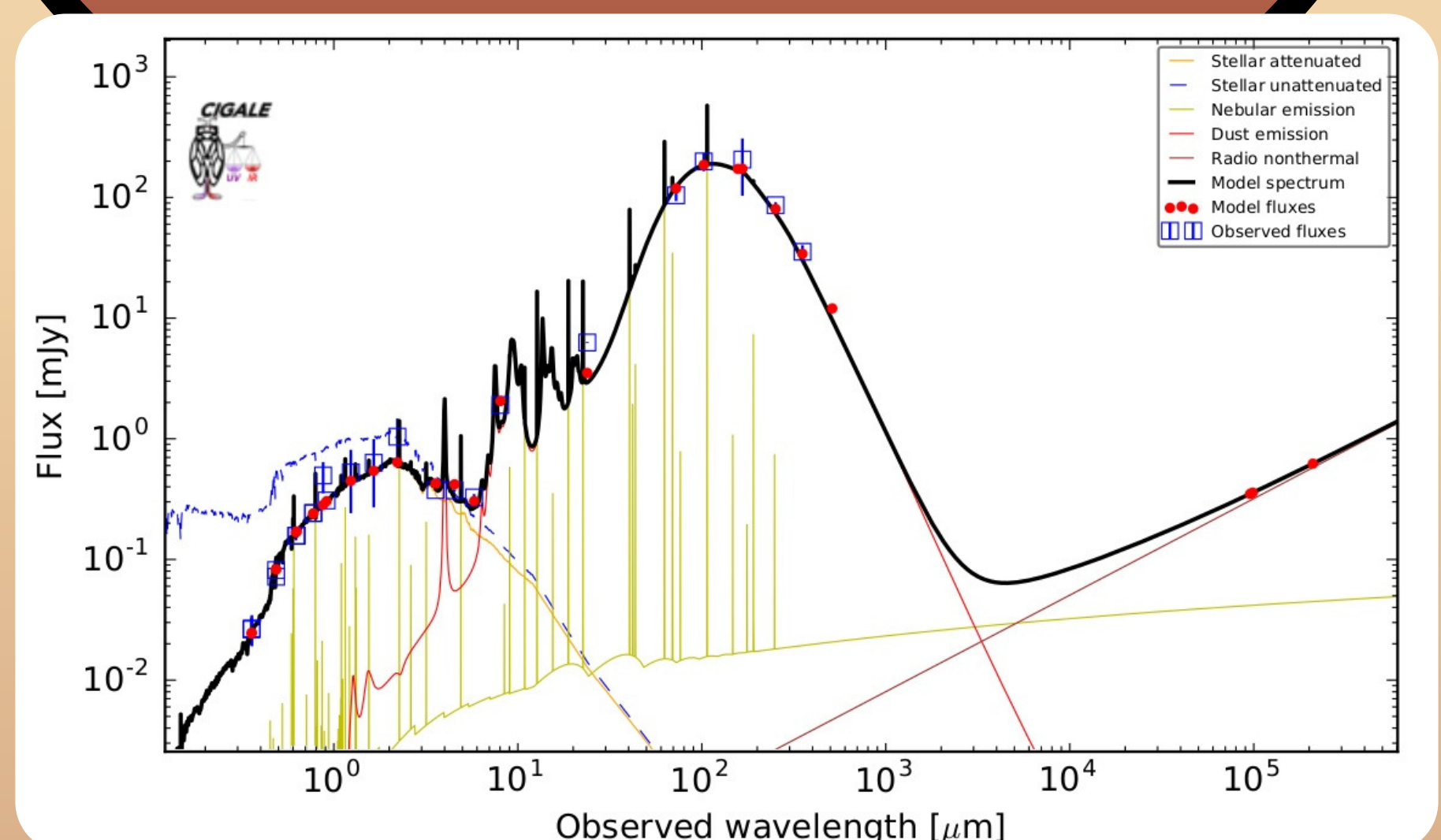
The field was also observed by multiple follow up surveys, this way there are photometric observations of the region from the radio. There are thousands of extragalactic objects in the region, so we collected the data and fitted Spectral Energy distribution of 400 galaxies, deriving their physical properties like stellar mass, star formation rate, and dust mass.

The positions of the examined galaxies. The colors show different redshift, blue $z < 0.2$, green: $0.2 < z < 0.5$, yellow $0.5 < z < 1$, red $z > 1$



Data, SED fitting

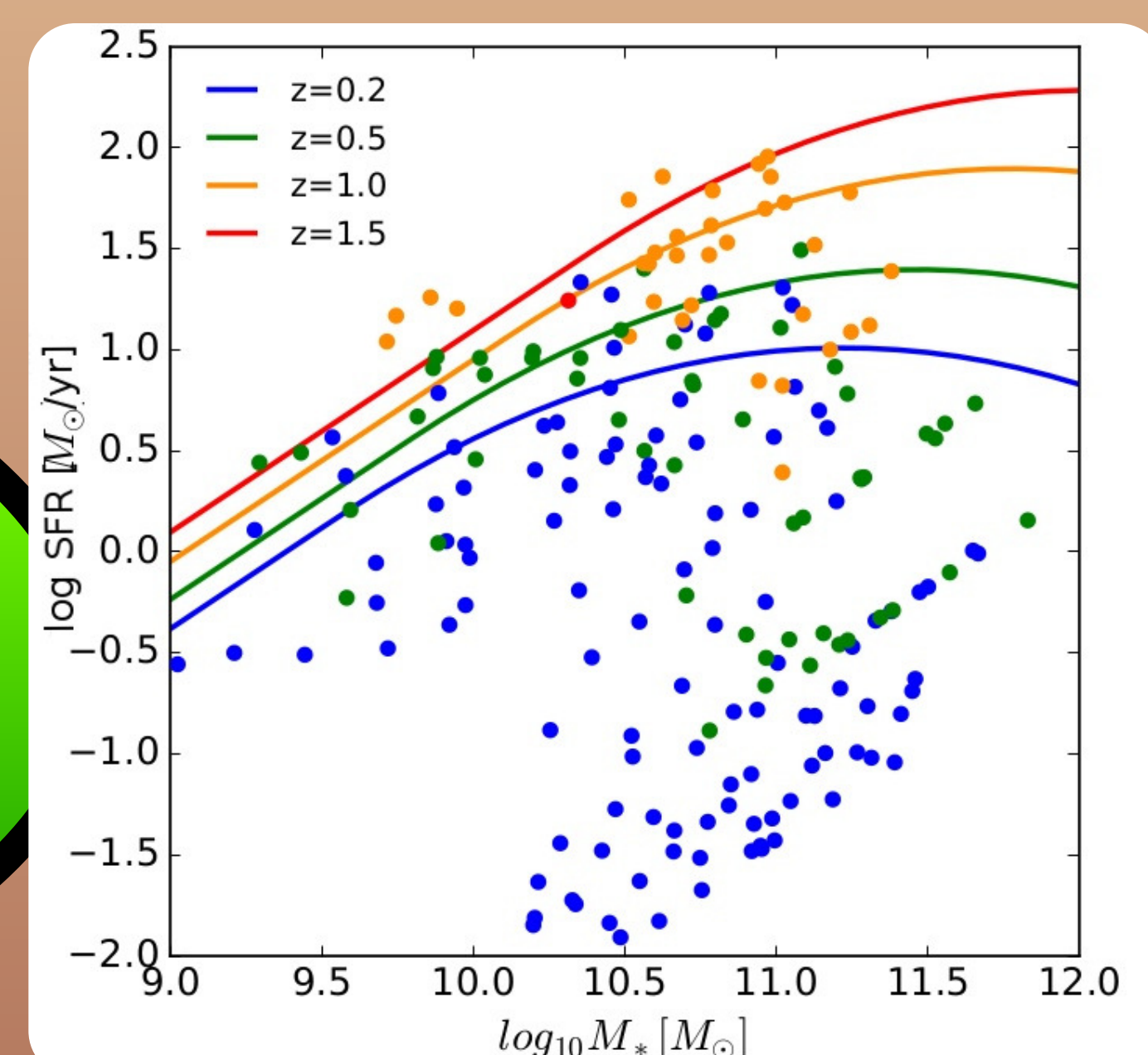
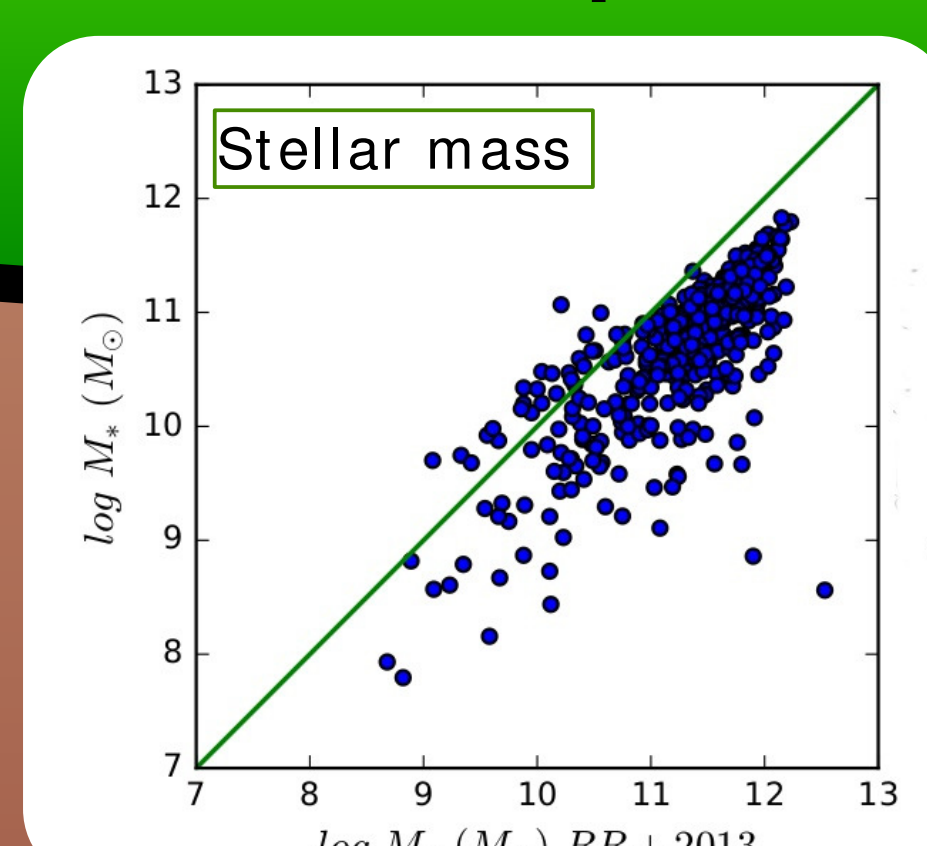
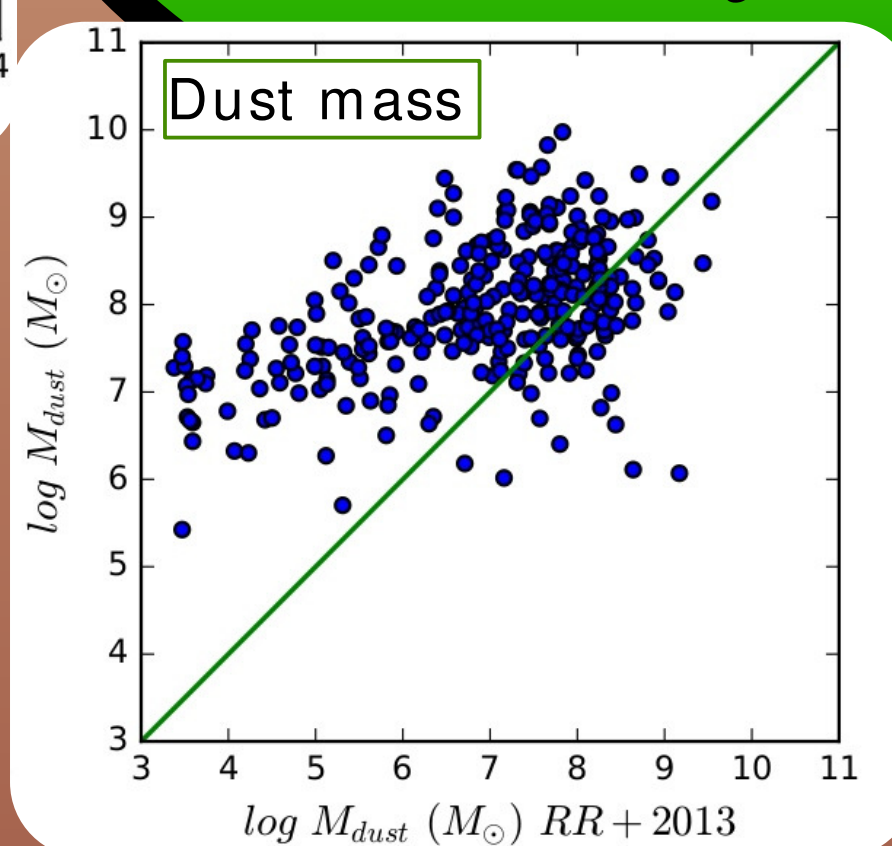
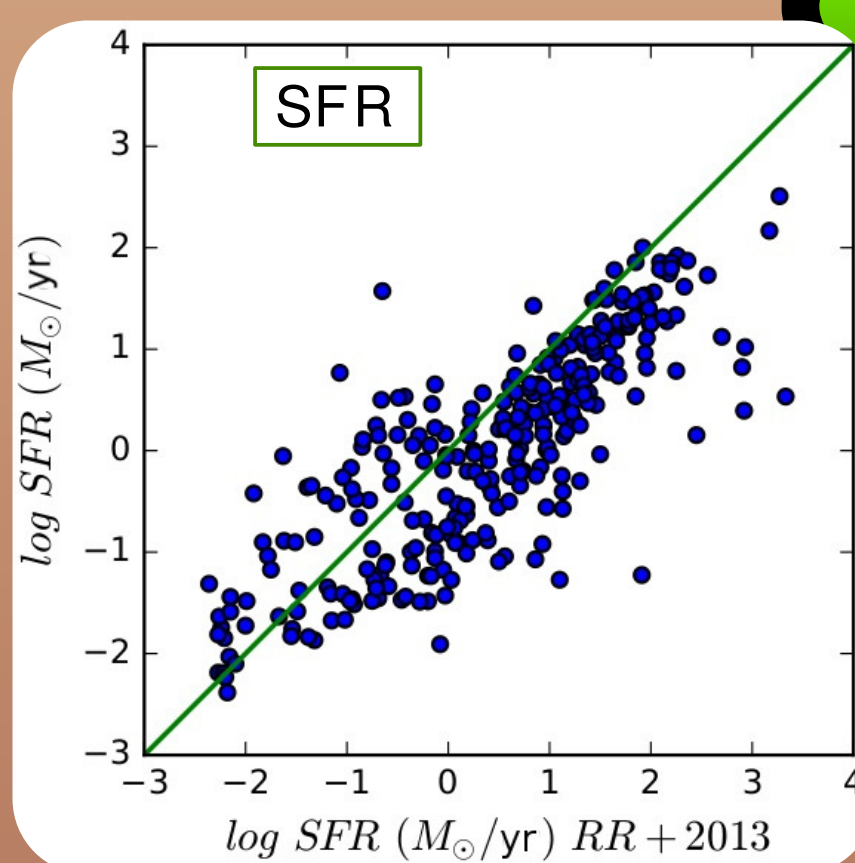
We collected photometric data from VIZIER, SDSS, and the new Herschel Point Source Catalogs. Including the Herschel far infrared data is very important for the estimations of the star formation rate and dust mass, because the dust obscuring the young stars emits radiation in this wavelength range. For the SED fitting we used CIGALE (Noll+2009, Roehlly+2014).



Results

The derived parameters were compared to previous results (Rowan+Robinson+2013), and also to the main sequence of galaxies. The stellar masses are systematically lower, and at higher star formation rate we get lower values. But the most prominent difference is in the dust mass.

Most of the galaxies are below the main sequence.



The positions of the galaxies on the main sequence of galaxies (Schreiber+2015). The star formation rate is higher at higher redshift and larger stellar mass.

References:

Roehlly, Y. et al, 2014, ASPC, 485, 347R
Schreiber, C. et al, 2015, A&A, 575A, 74S
Noll, S. et al, 2009, A&A, 507, 1793N
Rowan+Robinson, M. et al, 2013, MNRAS, 428, 1958R

Acknowledgements:

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This research has made use of the VizieR catalogue access tool, CDS, Strasbourg, France; and of the data supplied by the UK Swift Science Data Centre at the University of Leicester, and the SIMBAD database, operated at CDS, Strasbourg, France.



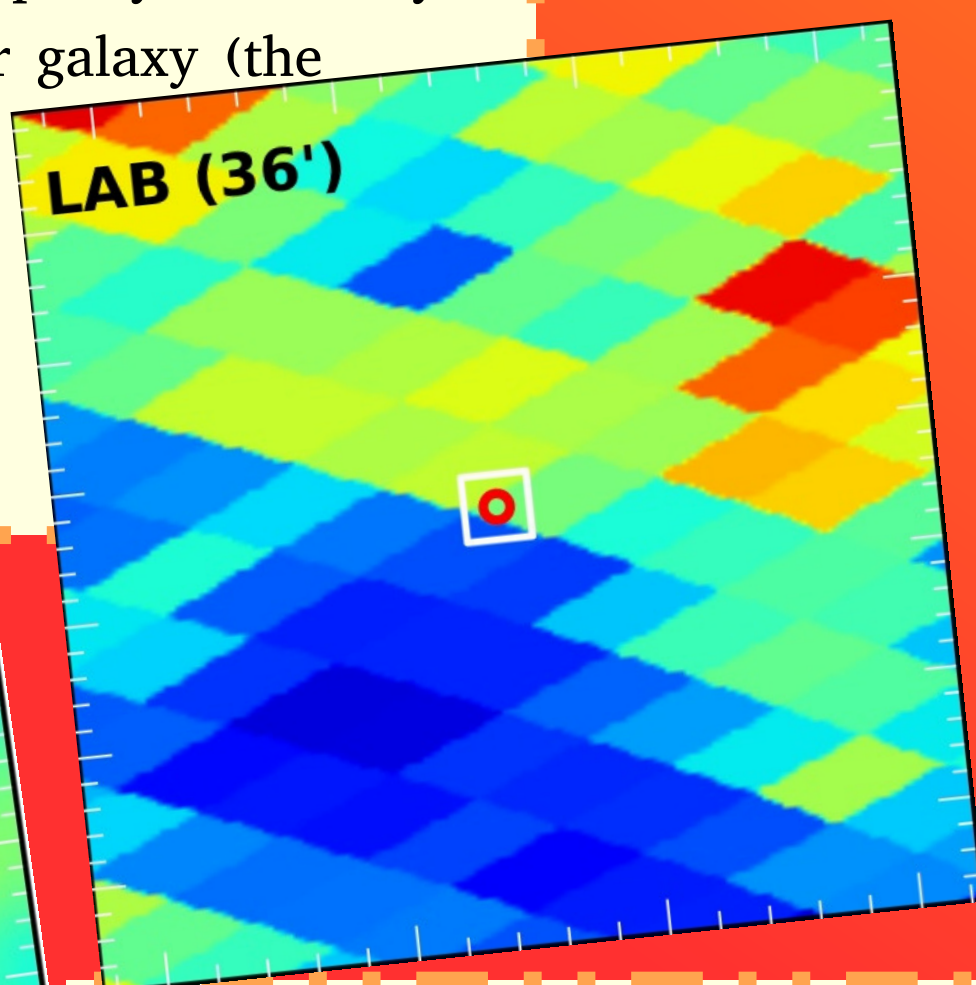
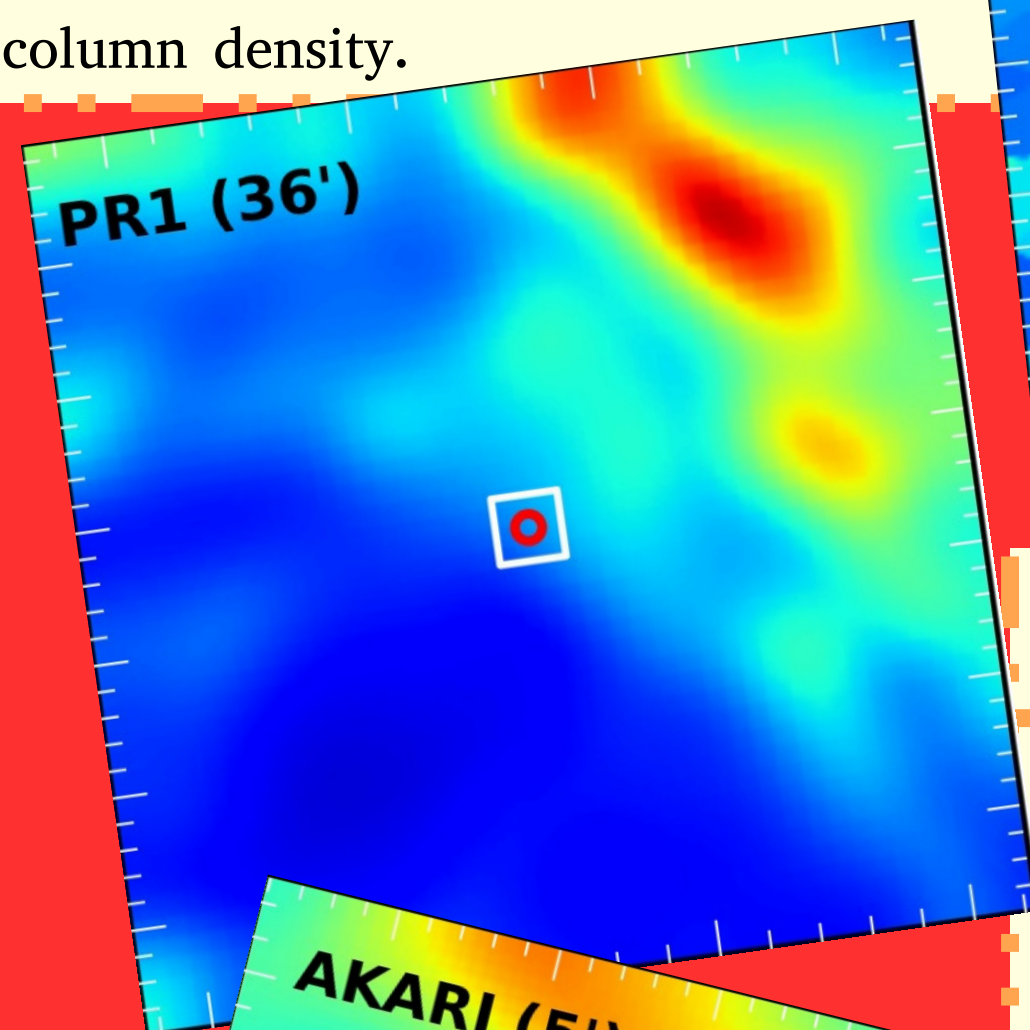
The galactic foreground of GRB051022

Tímea Orsolya Kovács¹, L. Viktor Tóth^{1,2}, Yasuo Doi⁴,
Sarolta Zahorecz^{5,6}, Sándor Pintér¹, Zsolt Bagoly¹,
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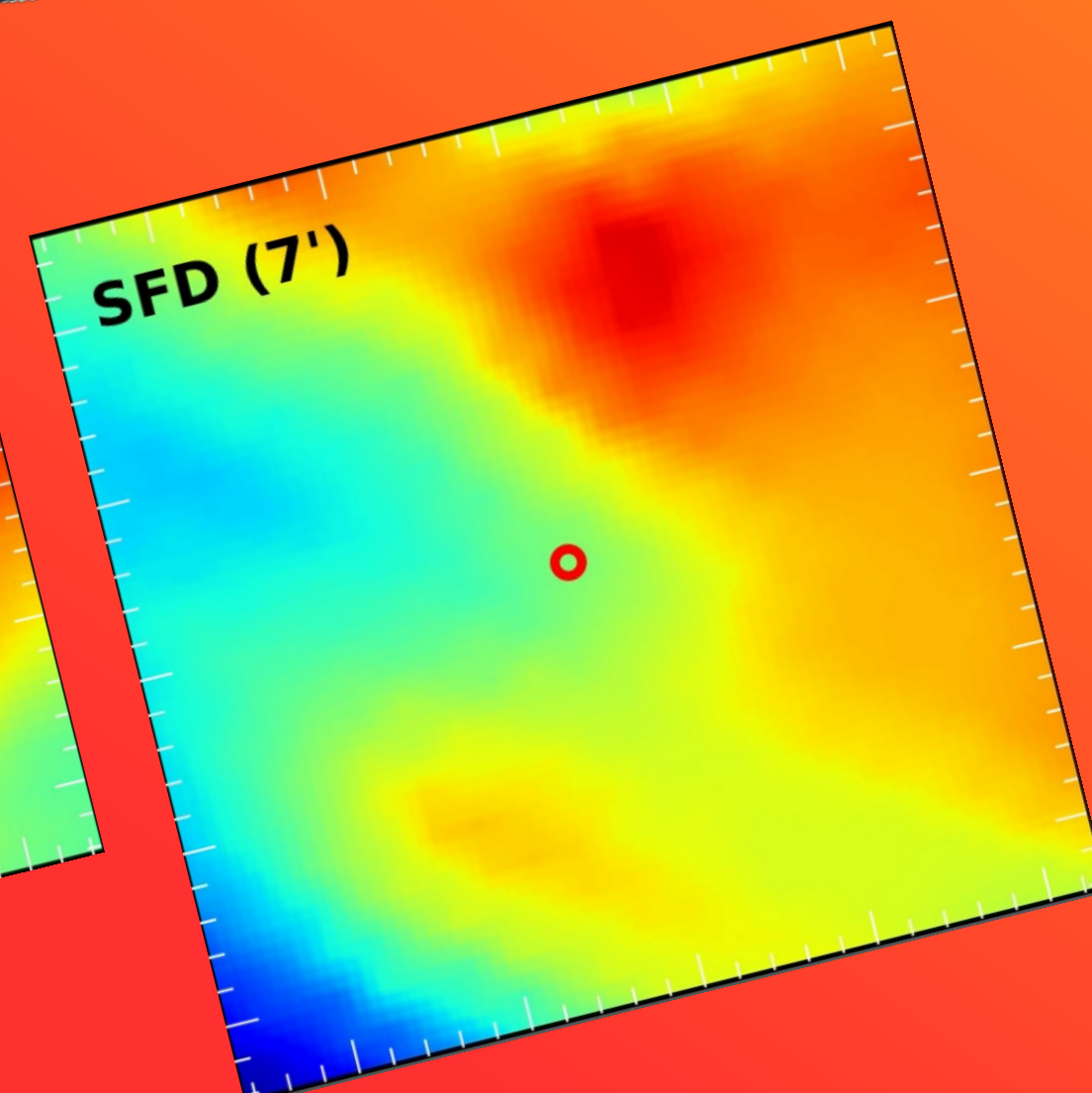
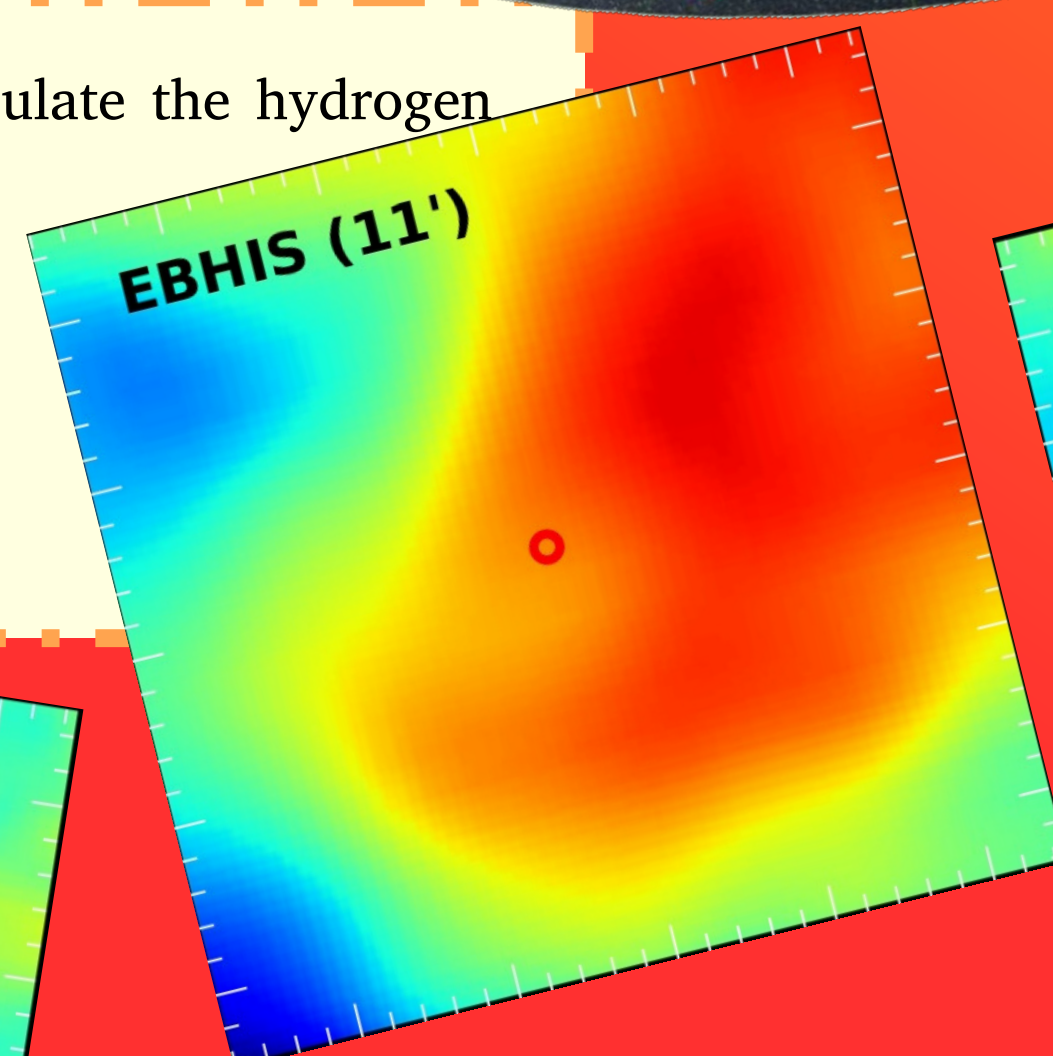
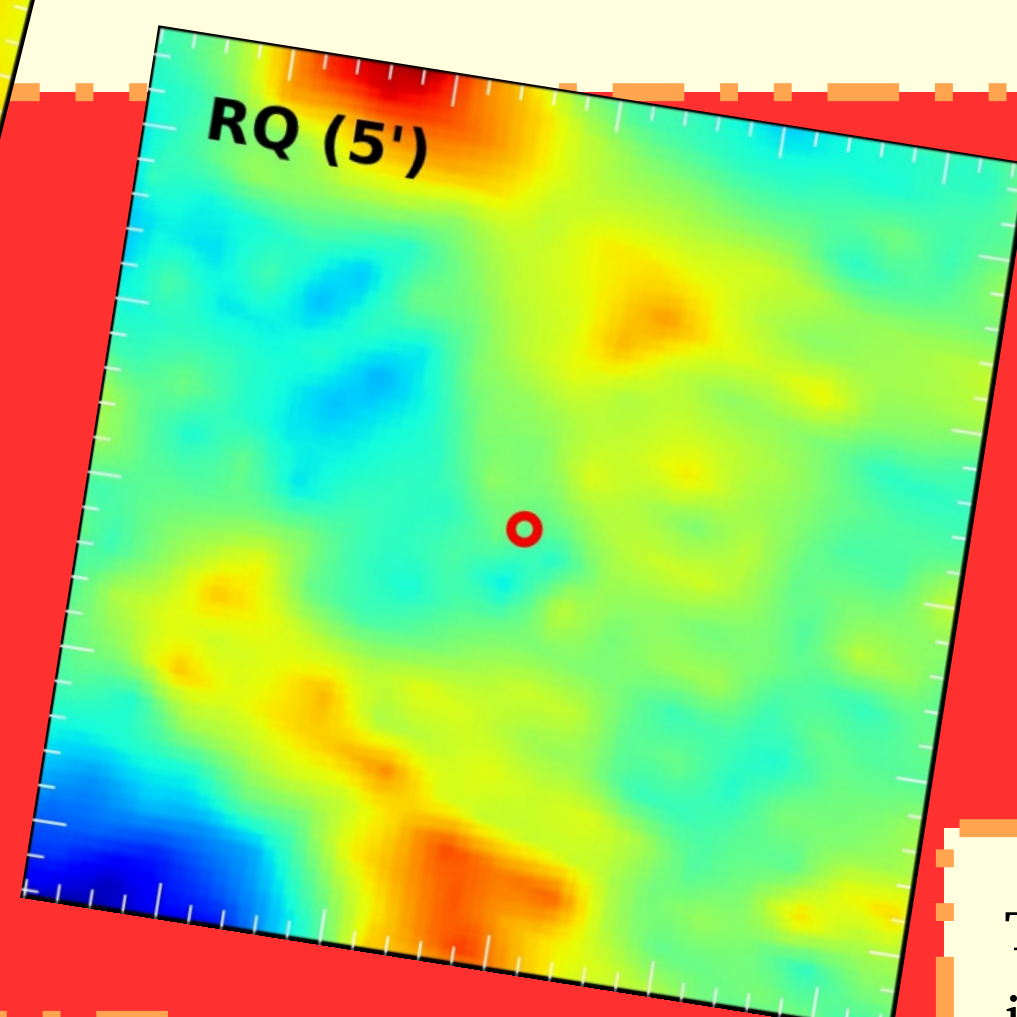
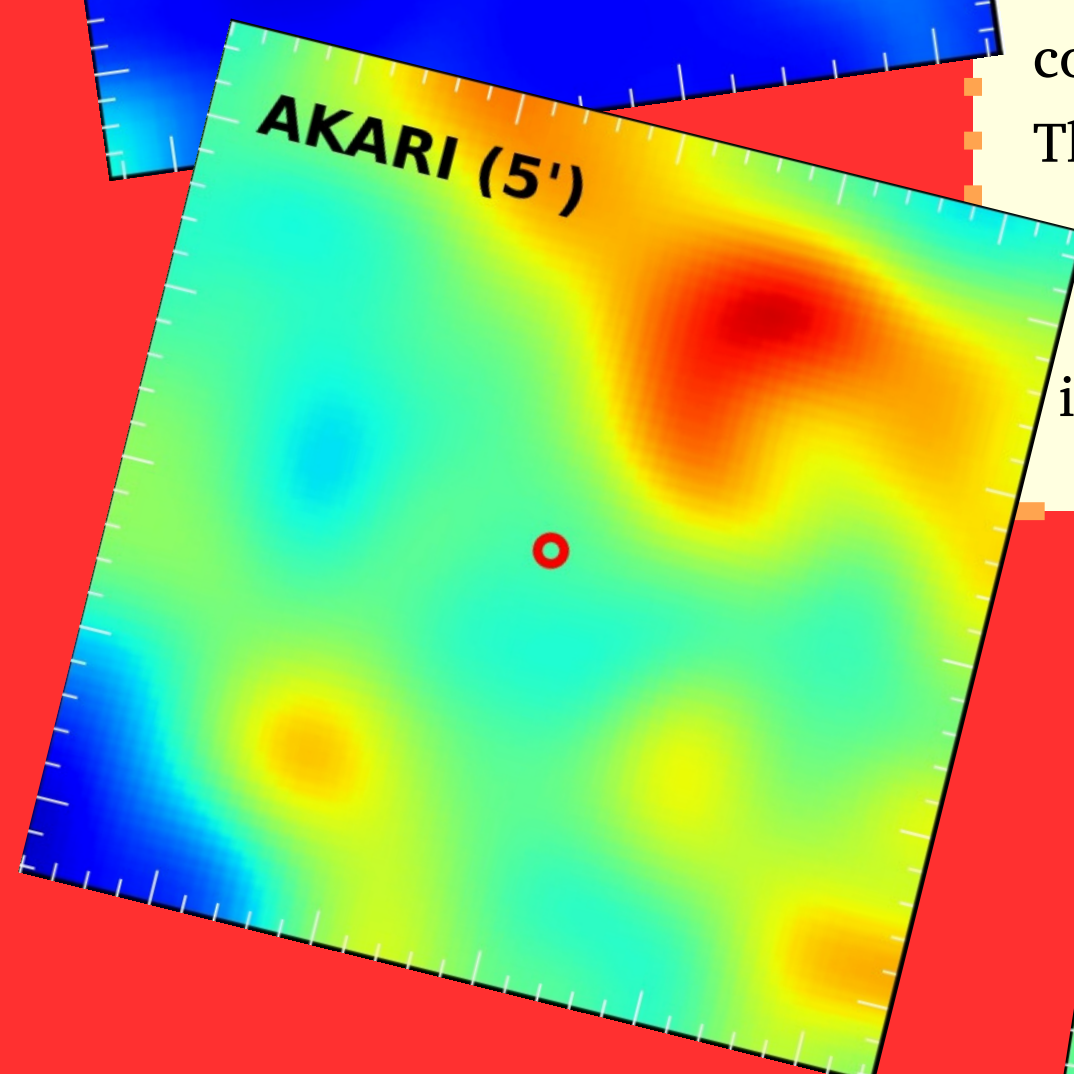
Introduction

GRBs are high energy explosions, and their afterglow can be detected long after the initial burst. The absorption in the X-ray spectrum is partly caused by the interstellar medium (ISM) in our galaxy (the Galactic foreground), and partly by the ISM in the host galaxy of the GRB. The extinction in the X-ray can be determined by the hydrogen column density.



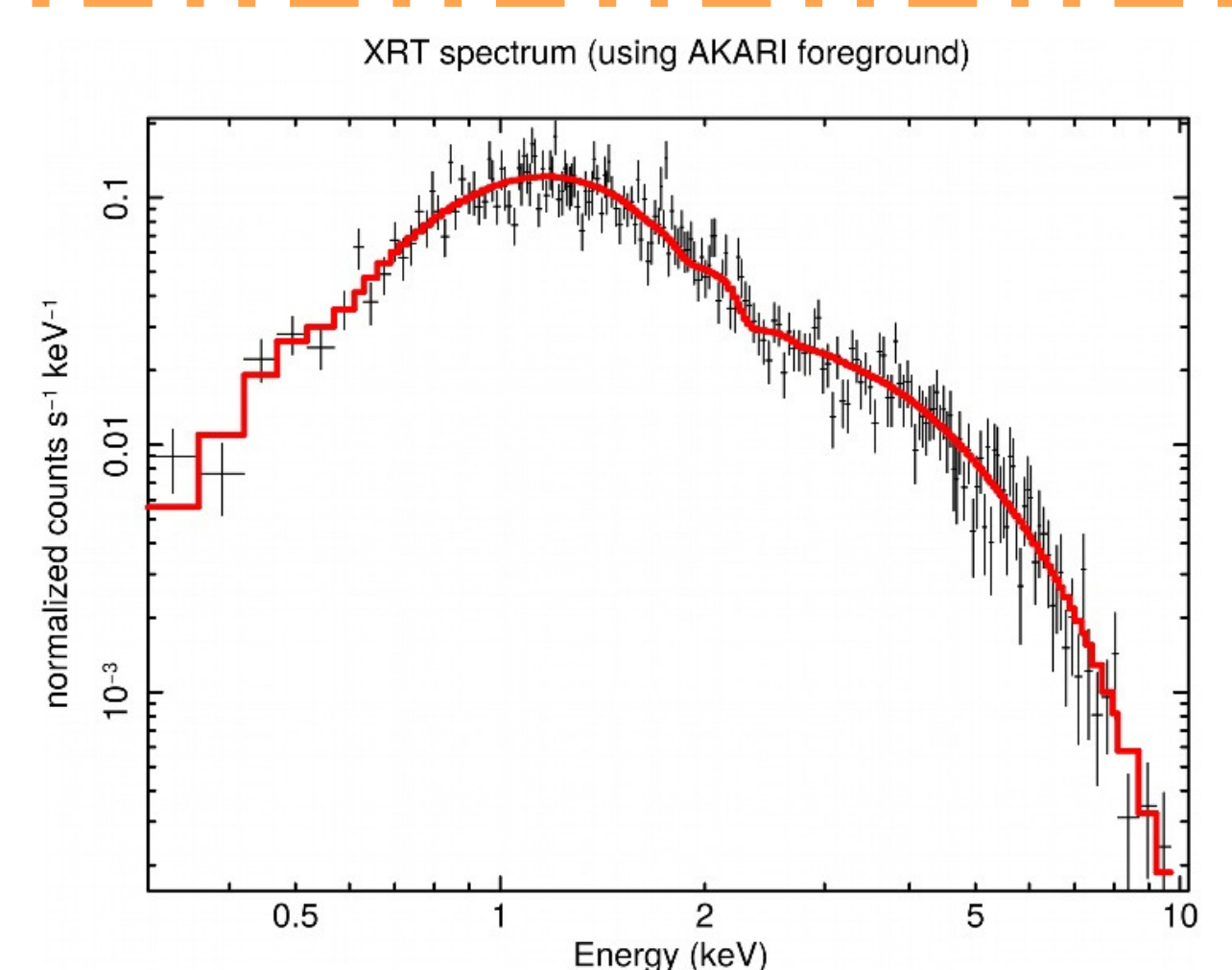
Different N(H) maps

Different surveys were used to calculate the hydrogen column density towards the GRB. The red circle marks the position, and the numbers in parenthesis show the resolution of the maps in arcminutes.



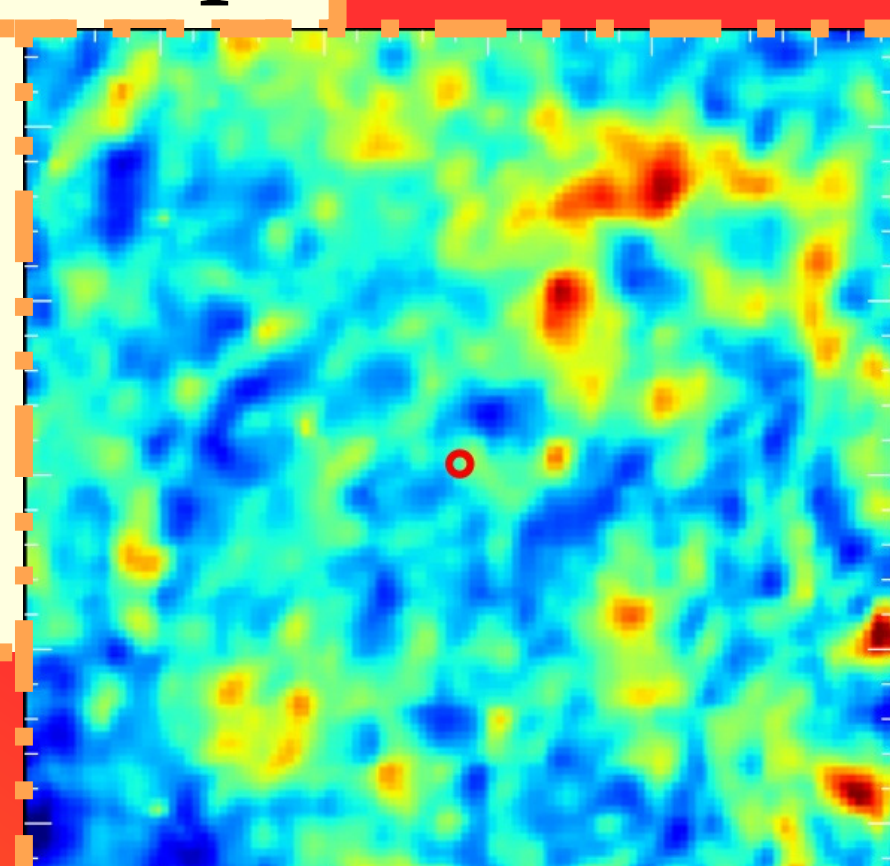
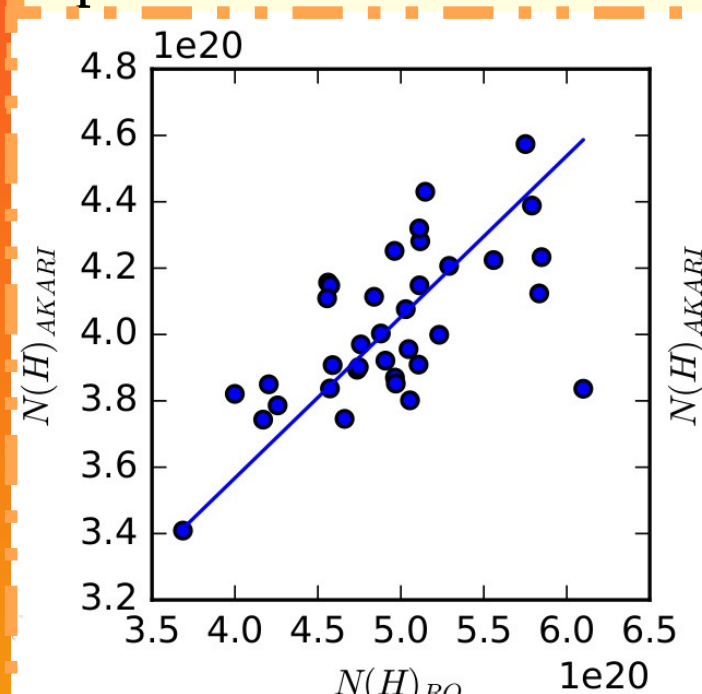
Refitting the XRT spectrum

The X-ray spectrum is refitted, using the N(H) got from the calibrated AKARI maps, and the intrinsic column density is derived. This way we can determine the ISM in the galaxy.



Calibrated AKARI map

The AKARI N(H) maps were calibrated by the Planck RQ maps. This way we can get the N(H), so the Galactic extinction at the position of the GRB.



References:

- Balázs, L. G. et al, 2015, MNRAS 452, 2236
A giant ringlike structure at $0.78 < z < 0.86$ displayed by GRBs
Tóth, L. Viktor et al, 2017, PKAS, 32, 113T
Foreground of Gamma-Ray Bursts from Akari Fis Data
Rácz, I. I. et al, 2017, CoSka, 47, 100R
Galactic and extragalactic hydrogen in the X-ray spectra of Gamma Ray Bursts

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This research has made use of the VizieR catalogue access tool, CDS, Strasbourg, France; and of the data supplied by the UK Swift Science Data Centre at the University of Leicester, and the SIMBAD database, operated at CDS, Strasbourg, France.