

# Ionized gas in the 2MASS J01313000-0625508 galaxy

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We present a detailed study of the EELRs in the Seyfert 2 galaxy 2MASX J013130.00-062550.8. We discovered two symmetric extended ( $\sim 20''$ , i.e.  $\sim 17.6$  kpc away from nucleus) ionized-gas clouds emitting in the  $[\text{OIII}]\lambda 5007$  line.

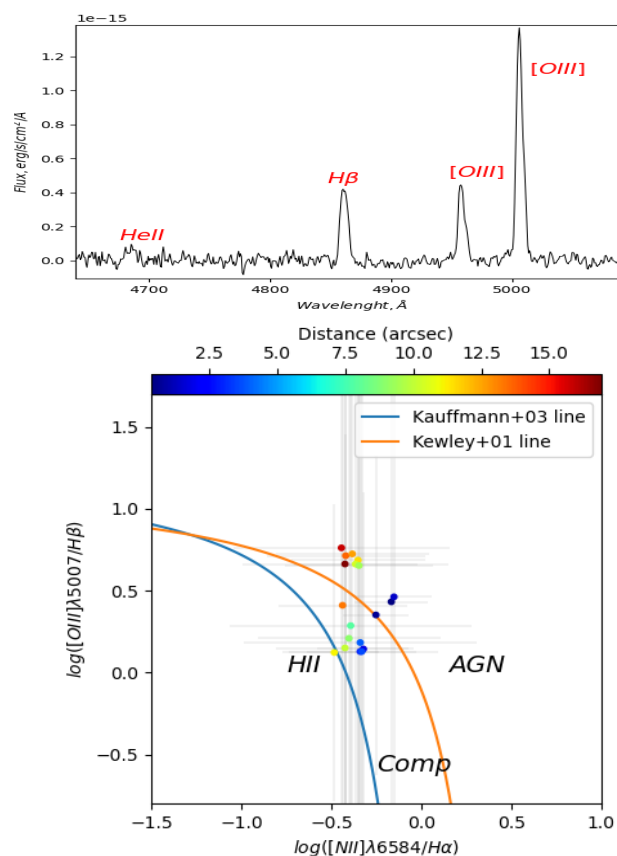
## Observations

Observations were carried out at the prime focus of the 6-m SAO RAS telescope with the multi-mode focal reducer SCORPIO-2 [1]. We used the long-slit spectroscopic mode to probe ionization state of the gas and the 3D spectroscopy with the scanning Fabry-Perot interferometer in the  $[\text{OIII}]\lambda 5007$  line to analyze the gas kinematics.

## Optical diagnostic diagrams

We determined the ionization state of the galactic gas using emission line ratio diagnostic diagrams [2] with separate lines from [3], [4]. EELRs are ionized by the AGN and photoionized.

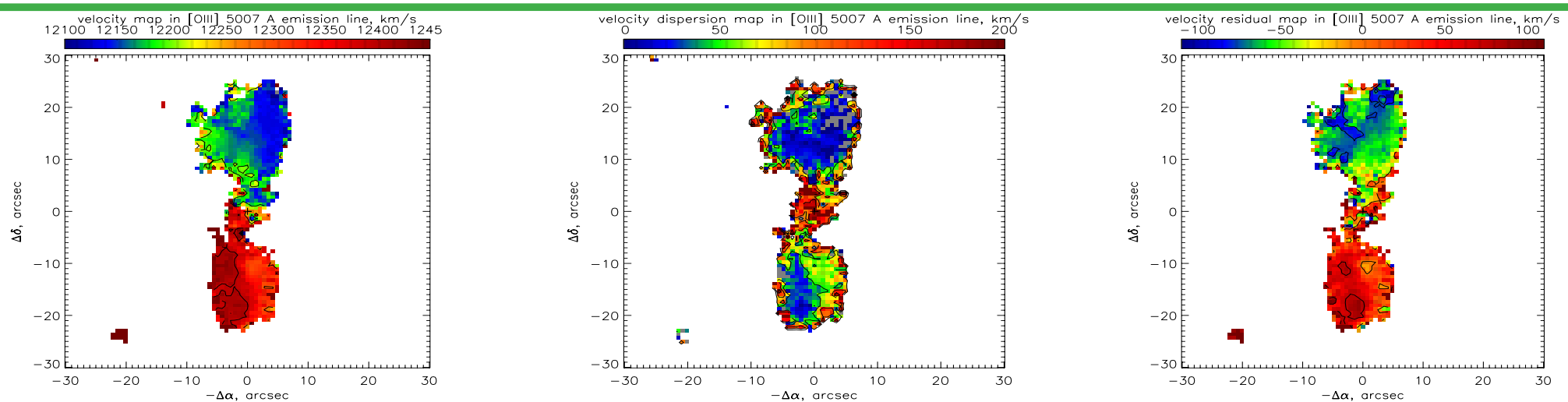
Presence of the  $\text{HeII}\lambda 4686$  in the long-slit spectra demonstrate that EELRs are ionized by the nuclear radiation.



## Kinematics analysis

The velocity map of the  $[\text{OIII}]\lambda 5007$  gas was analyzed using DetKA package with the tilted-ring model [6]. Kinematic parameters were obtained from the isophotal analysis with the Photutils Python package:  $i=65^\circ$ ,  $\text{PA}=125.2^\circ$ .

EELRs are laying in the galactic plane according the low velocity residuals.



## Hypothesis:

- 1) **Jet-gas interaction.** But there are no evidence for large-scale radio jet according the VLA FIRST survey (1.4 GHz), the brightest pixel has flux density = 12.56 mJy.
- 2) **External gas accretion.** EELRs are dynamically cold (velocity dispersion  $10 < \sigma < 50$  km/s), so presence of the extended clouds could be explained by the accretion of the external gas similar with the EELRs around fading AGN (described in [7]). Source of the gas is still unknown.

## Literature

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