

A New Diagnostic to Separate Line Emission from Star Formation, Shocks, and AGN Simultaneously in IFU Data

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Проблем классической BPT-диаграммы смешаны:

- области AGN (в смысле hard extreme UV) и ударной ионизации.
- “mixing sequence” (starburst-AGN mixing)

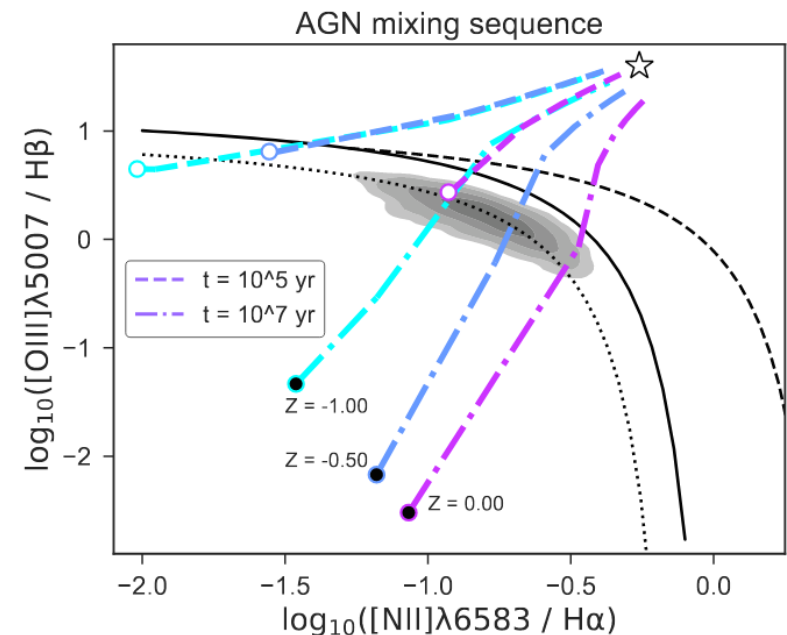
Обычно положение на “mixing sequence” интерпретируют в терминах роста вклада AGN. Но недоучет ударных волн → переоценка роли AGN

Данные: Siding Spring Southern Seyfert Spectroscopic Snapshot Survey (=S7; Thomas et al. 2017).

WiFeS/2.3 m telescope R=7000 (red) 3000 (blue)
38 x 25 arcsec

Семинар VOLGA 04/03/2019, Моисеев

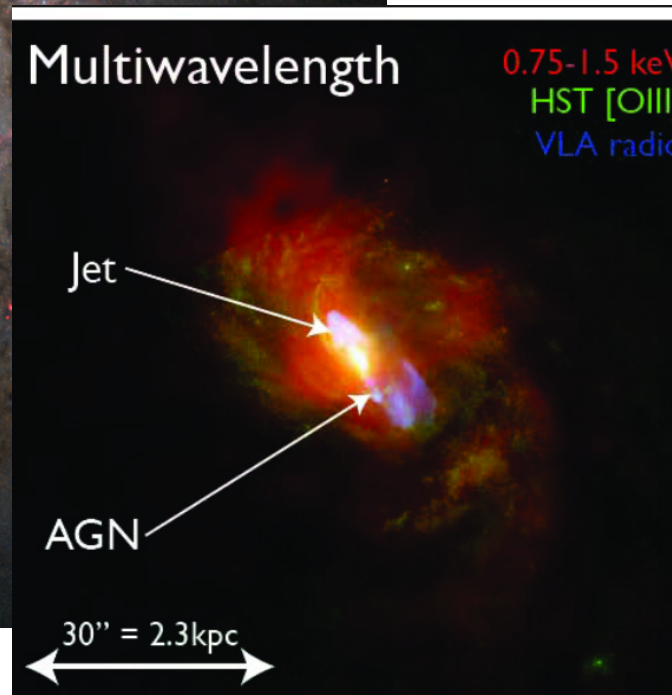
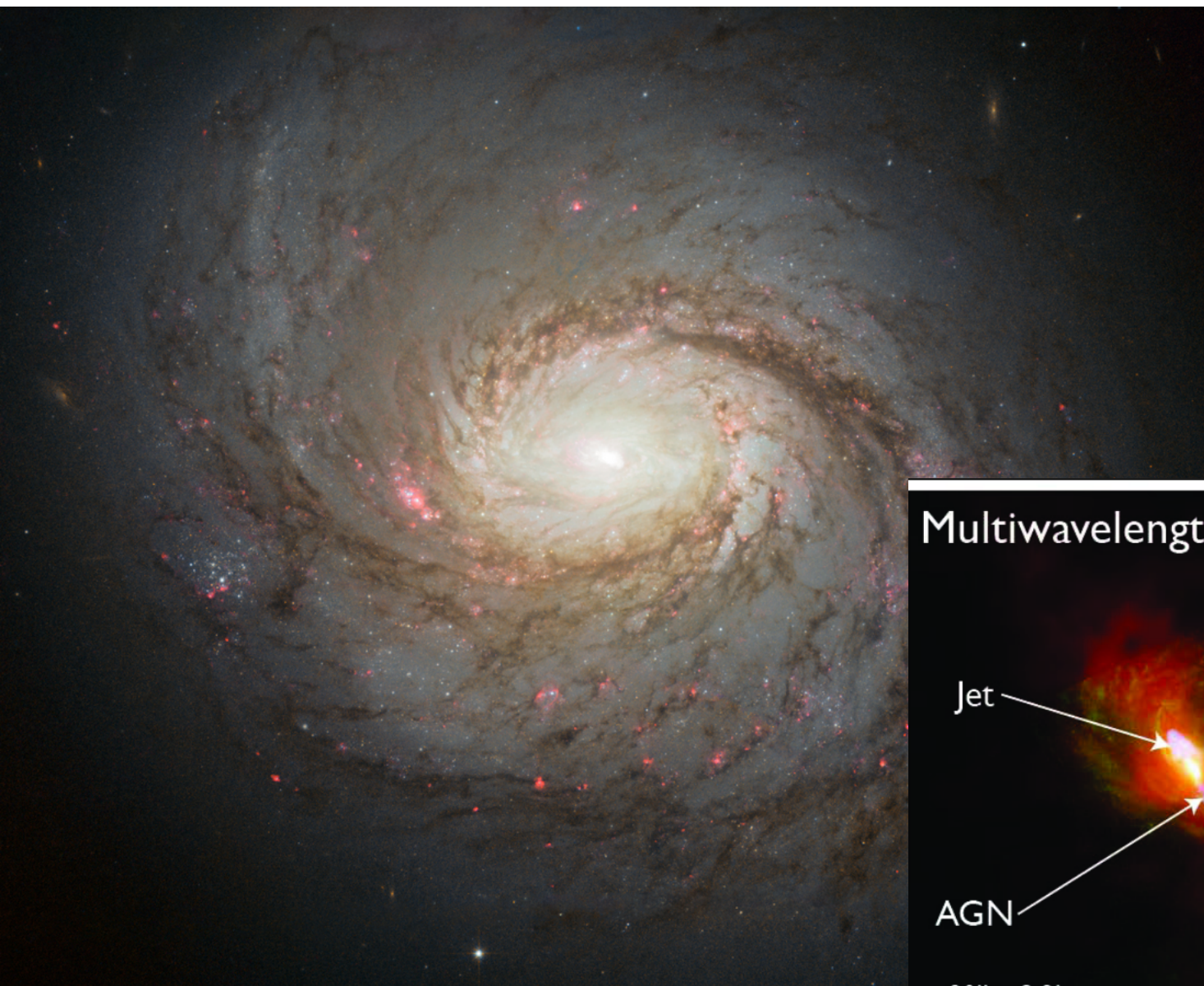
Deckey+19:



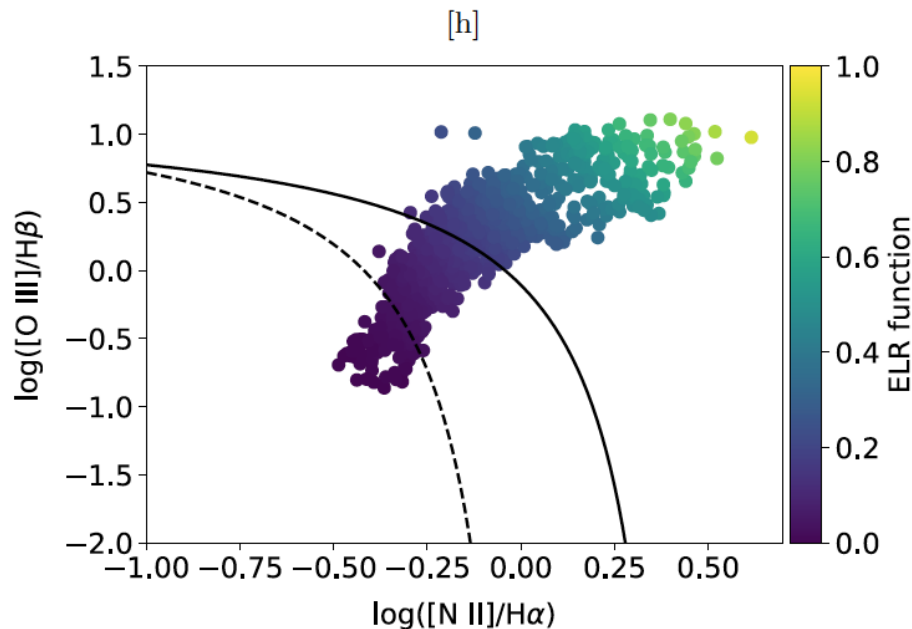
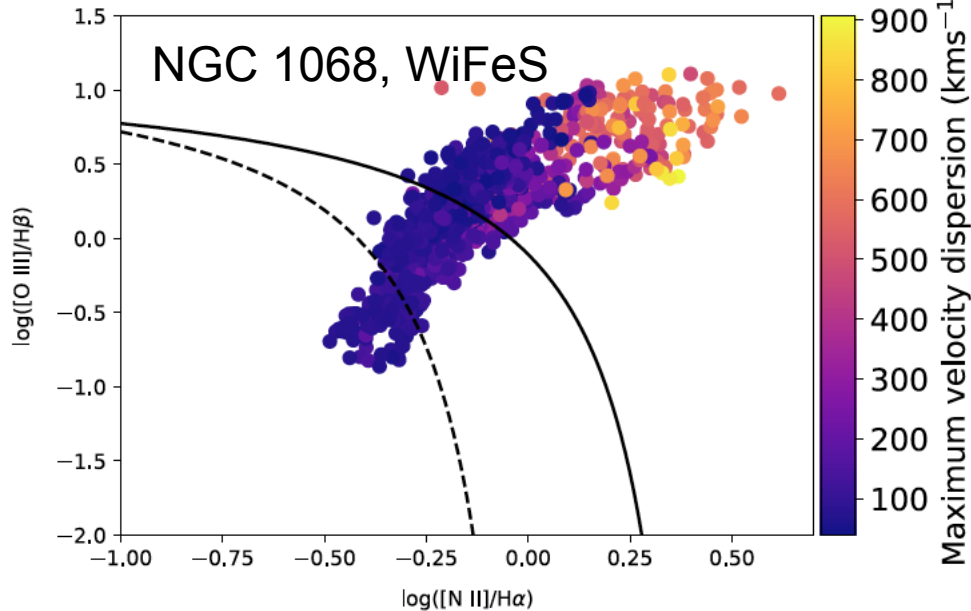
NGC 1068 (M77)

Есть ВСЁ:

- Sy 2 AGN
- biconical outflow
- shocked gas at the bar edges
- circumnuclear SF ring (SFR=100 M/yr?)



МАКСИМАЛЬНАЯ дисперсия в спакселе



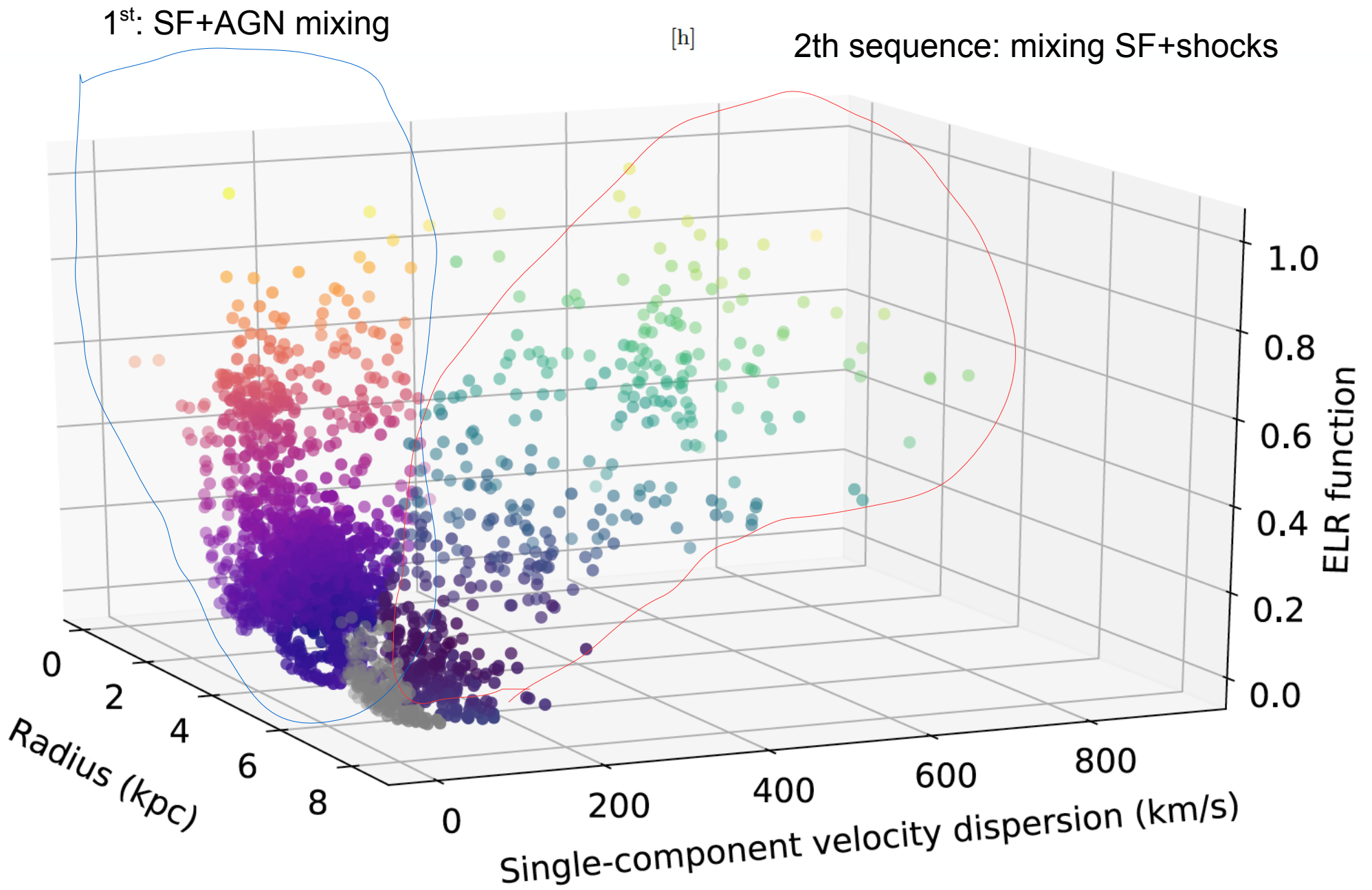
Разложение спектров – до 3х гауссиан, сколько взять – решает нейронная сеть :

ponents (see [Ho et al. 2016](#)). The recommended number of one, two, or three Gaussian components for each spaxel is then determined by a neural network (LZCOMP; [Hampton et al. 2017](#)). The maximum velocity dispersion in each spaxel

$$\text{ELR function} = \frac{\log([\text{NII}]/\text{H}\alpha) - \min_{\log([\text{NII}]/\text{H}\alpha)}}{\max_{\log([\text{NII}]/\text{H}\alpha)} - \min_{\log([\text{NII}]/\text{H}\alpha)}} \times \frac{\log([\text{OIII}]/\text{H}\beta) - \min_{\log([\text{OIII}]/\text{H}\beta)}}{\max_{\log([\text{OIII}]/\text{H}\beta)} - \min_{\log([\text{OIII}]/\text{H}\beta)}}$$

Легко рассчитать, но этот параметр “data depended”, его величина сама по себе не связана с ионизацией

ELR – через полный поток всех компонент



Теперь уже – дисперсия каждого из компонент, т.е.
 В одном спакселе – одни R, ELR и до 3х штук “сигм”

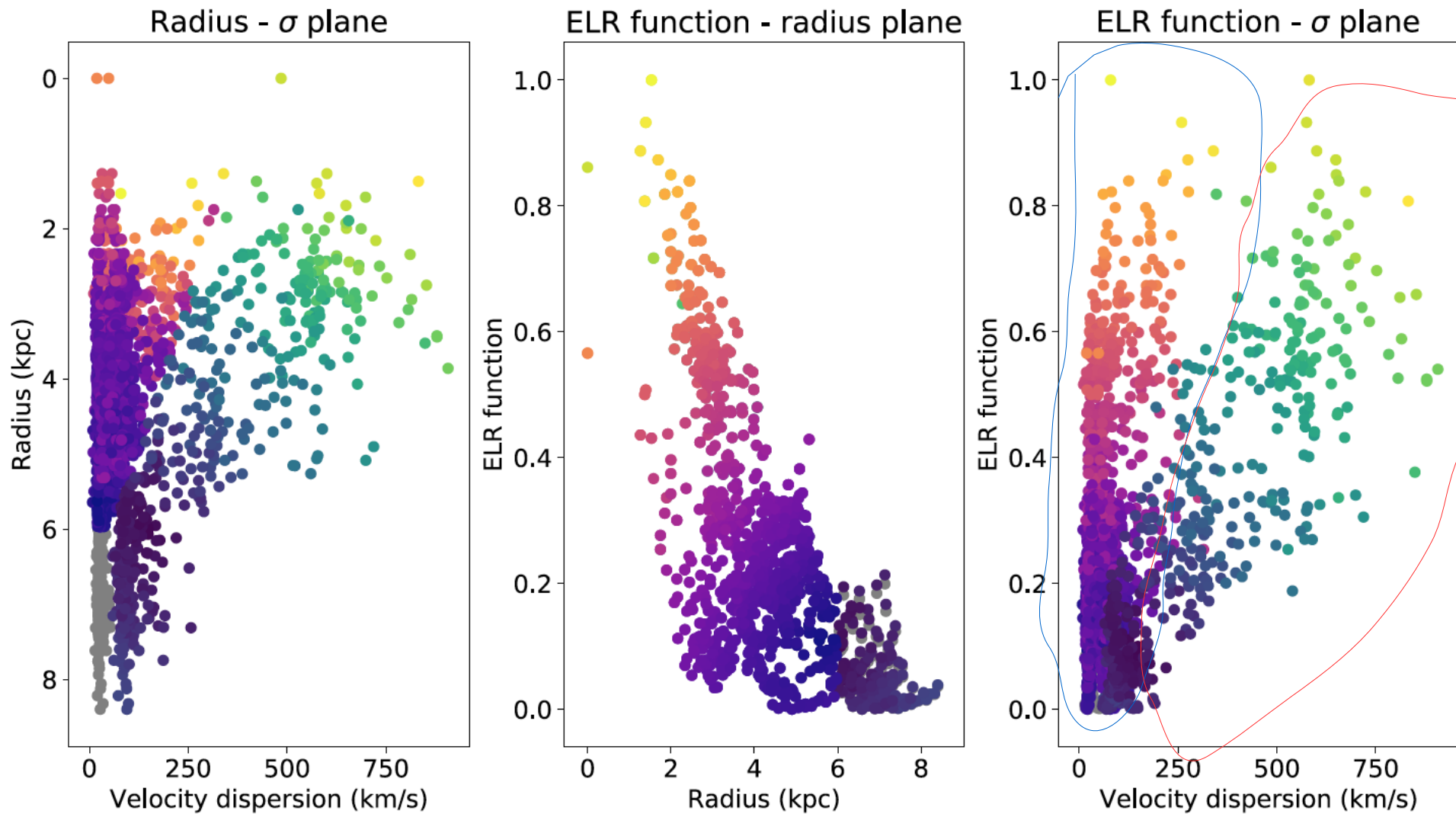
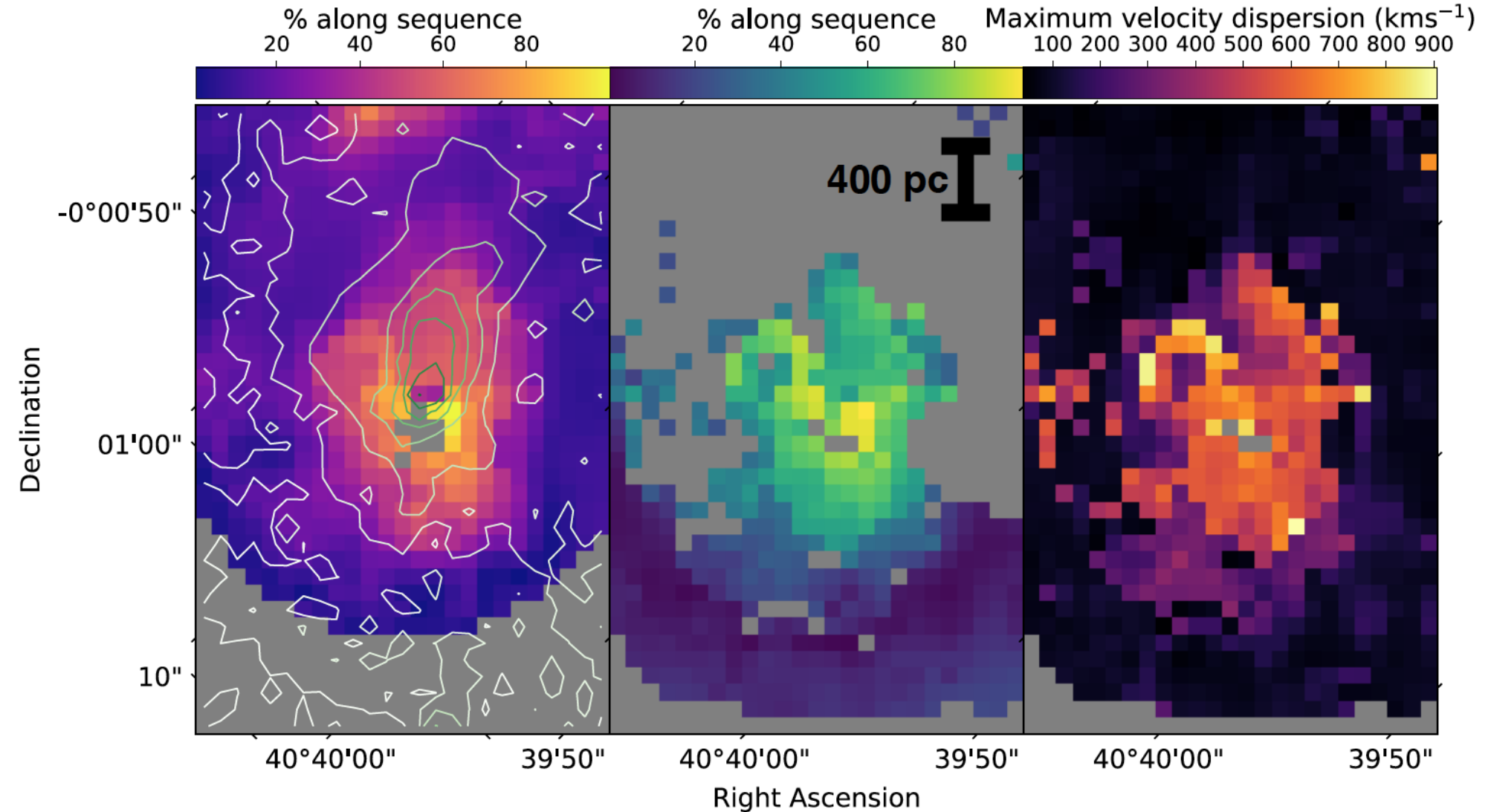


Figure 2. 3D diagnostic diagram of NGC 1068, showing two distinct mixing sequences of spaxels. The velocity dispersion value is the velocity dispersion of the individual components. Each individual-component velocity dispersion is combined with the total flux (‘zeroth’ component), and the radius value for the spaxel to form a data point. The purple-to-yellow sequence is referred to as the ‘first’ sequence, and the deep blue-to-yellow sequence is referred to as the ‘second’ sequence. Grey spaxels are those which are not definitively in either sequence. The first sequence shows mixing between emission from star formation and AGN, and the second sequence shows the mixing between the star formation and shocks. Significant scatter appears between the two sequences, indicating mixing also between the AGN



- 1: SF+AGN согласуется с распределением рентгена
В этой последовательности в основном 1й (узкий) компонент профиля
- 2: AGN+shocks – с картой дисперсии скоростей
В этой последовательности в основном 3й (широкий) компонент

