

Ключевые программы проекта РадиоАстрон

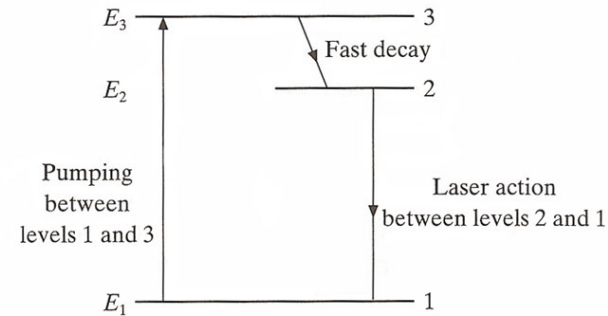


Почему радио диапазон?

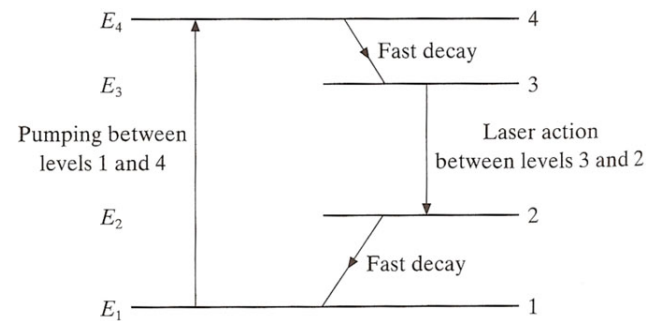
- Прозрачная атмосфера
- Реликтовое излучение (CMB)
- 21 см
- Пульсары -> шкала времени
- Квазары -> система координат
- Возможна интерферометрия

Мазеры

Microwave Amplification by the Stimulated Emission of Radiation



Principle of the three-level laser.



Principle of the four-level laser.

OH (hydroxyl)

H₂O

SiO

CH

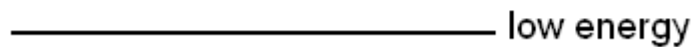
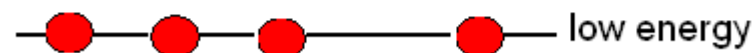
H₂CO

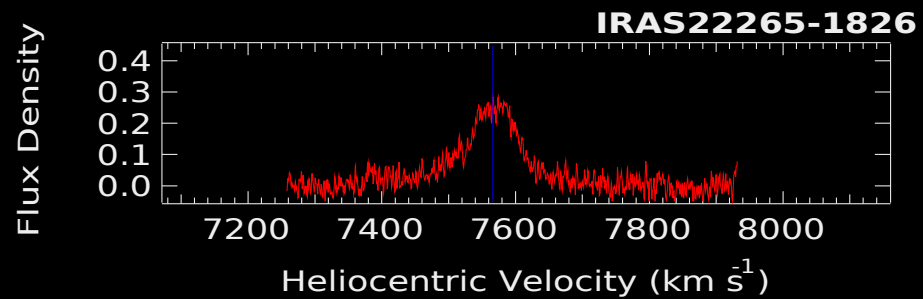
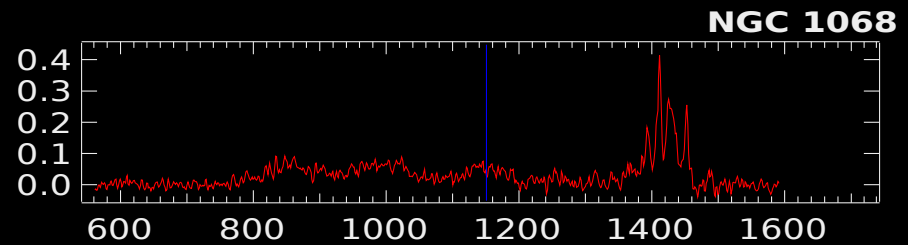
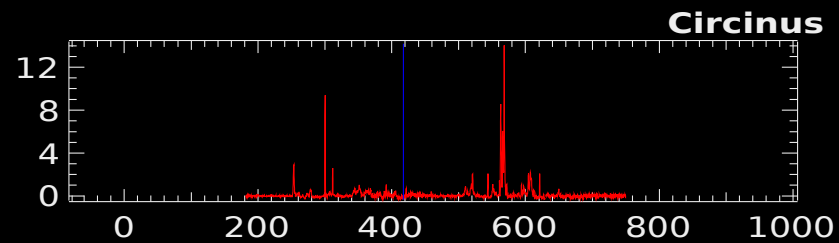
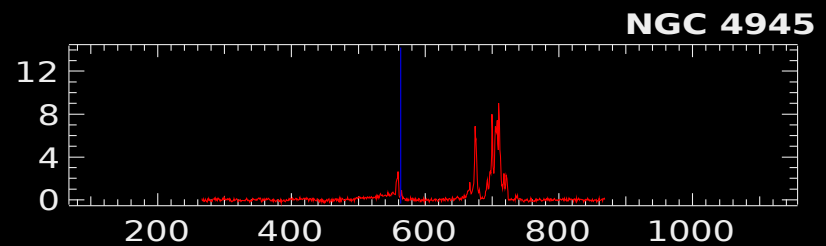
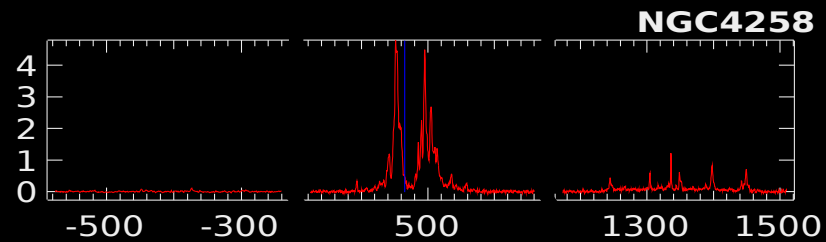
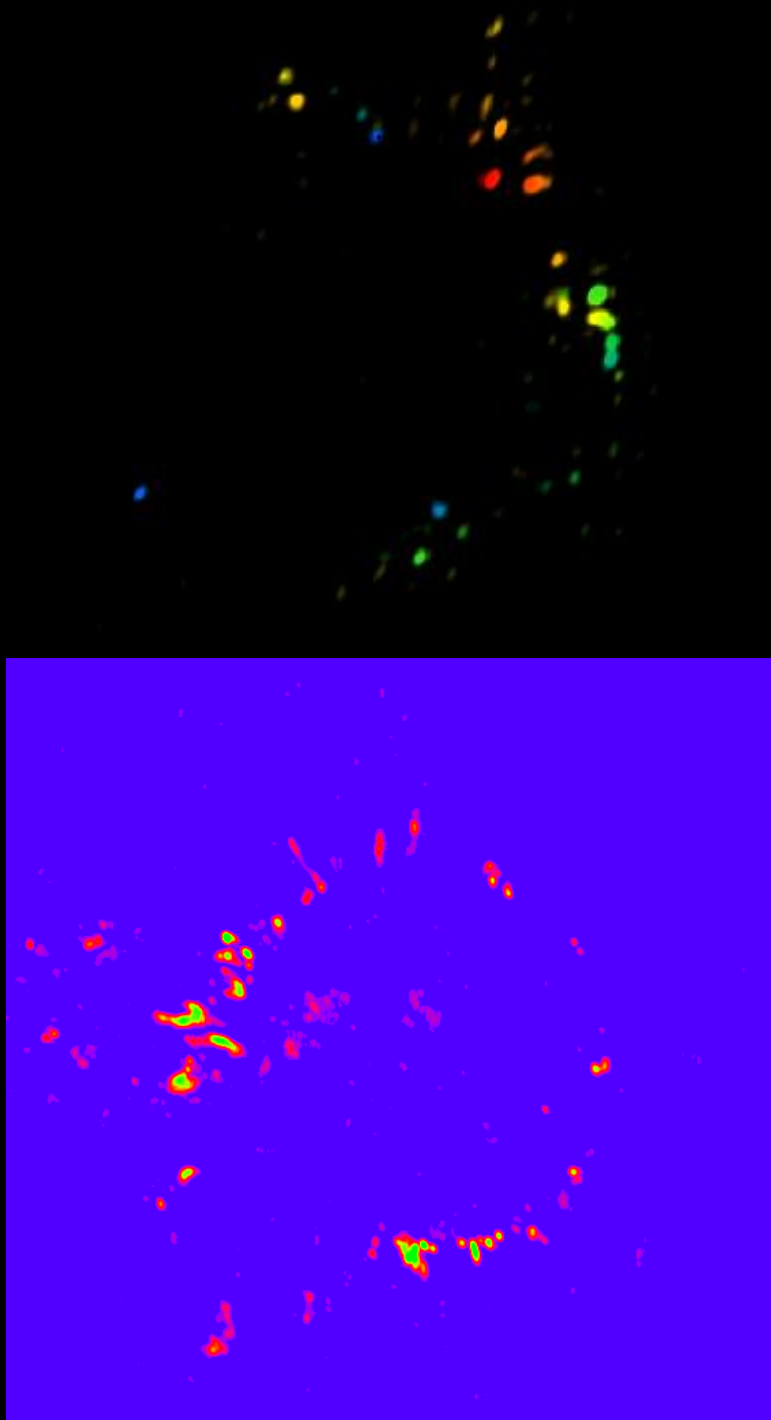
CH₃OH

NH₃

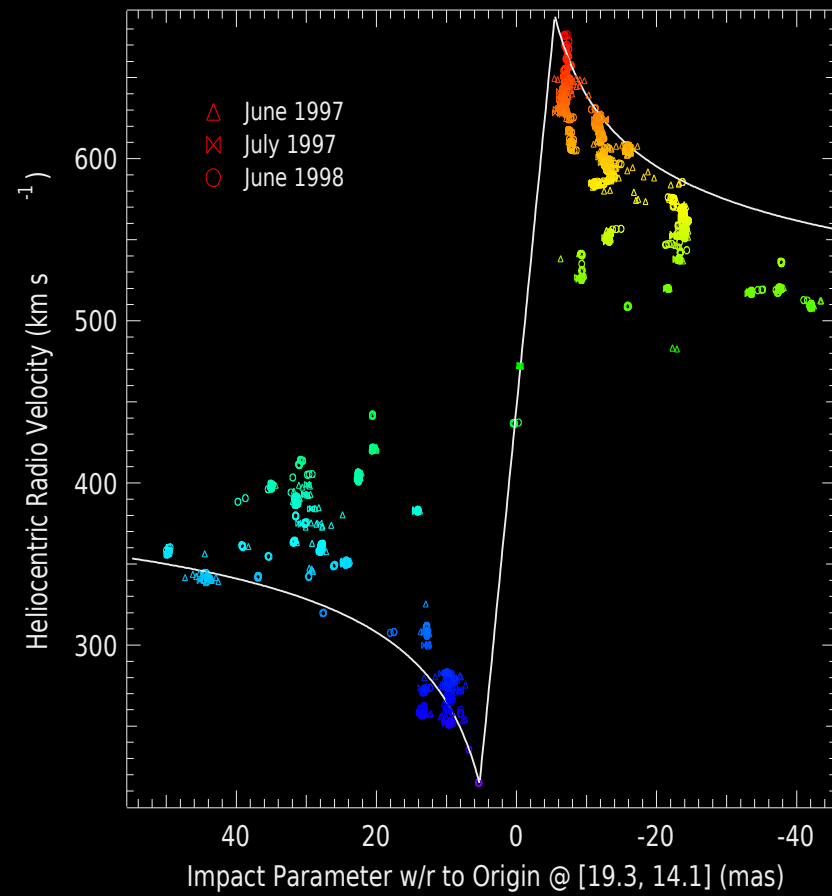
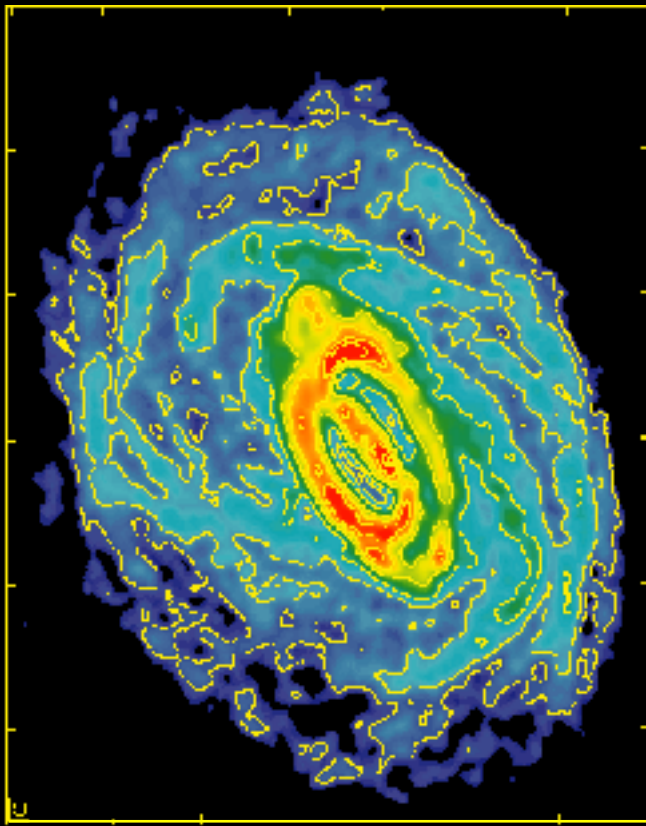
HC₃N

HCN

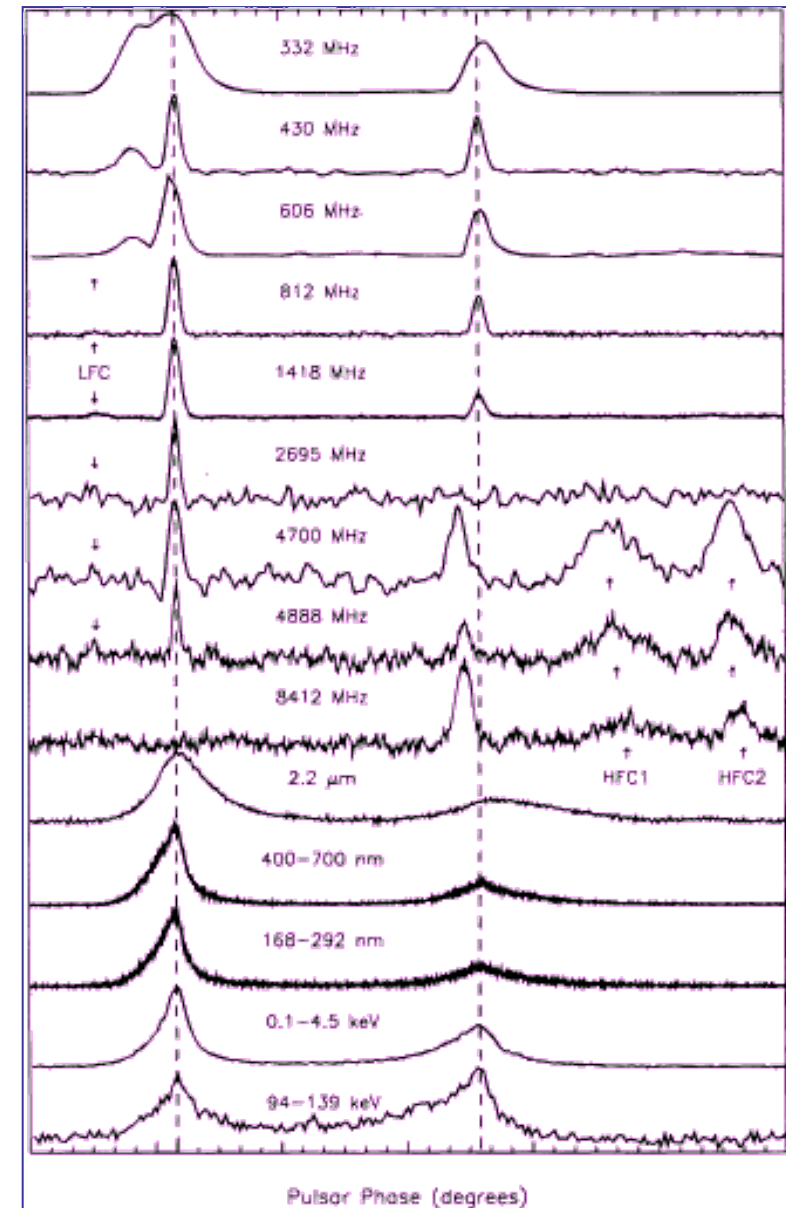
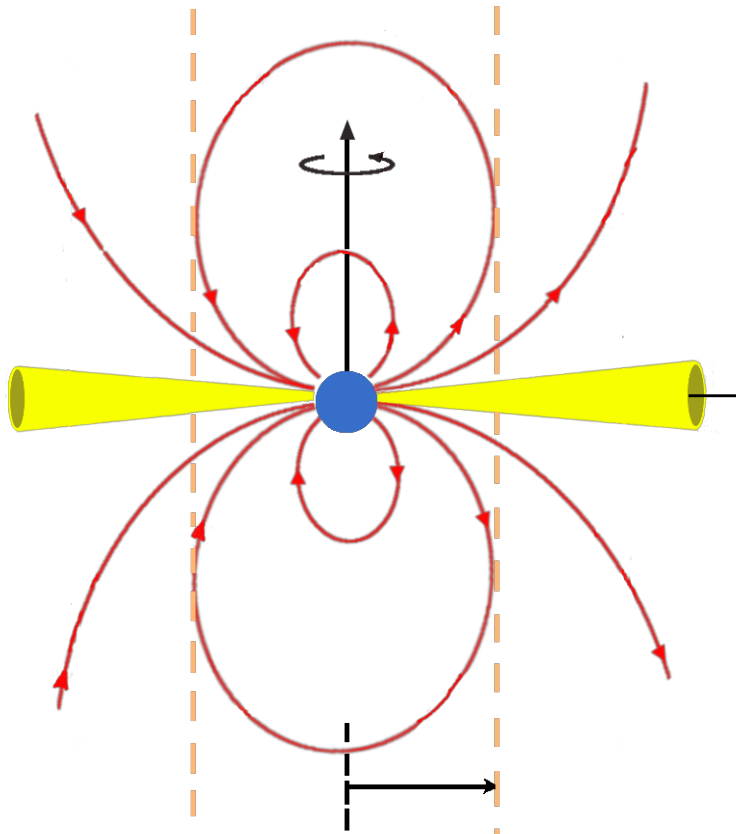
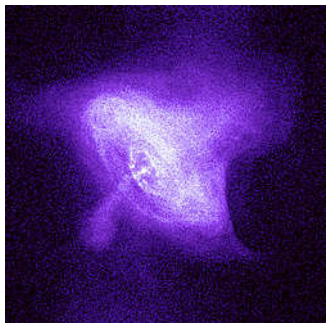
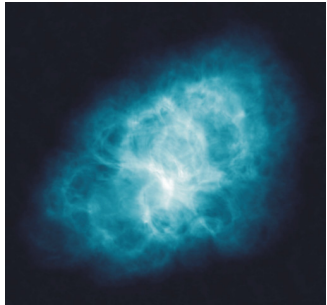


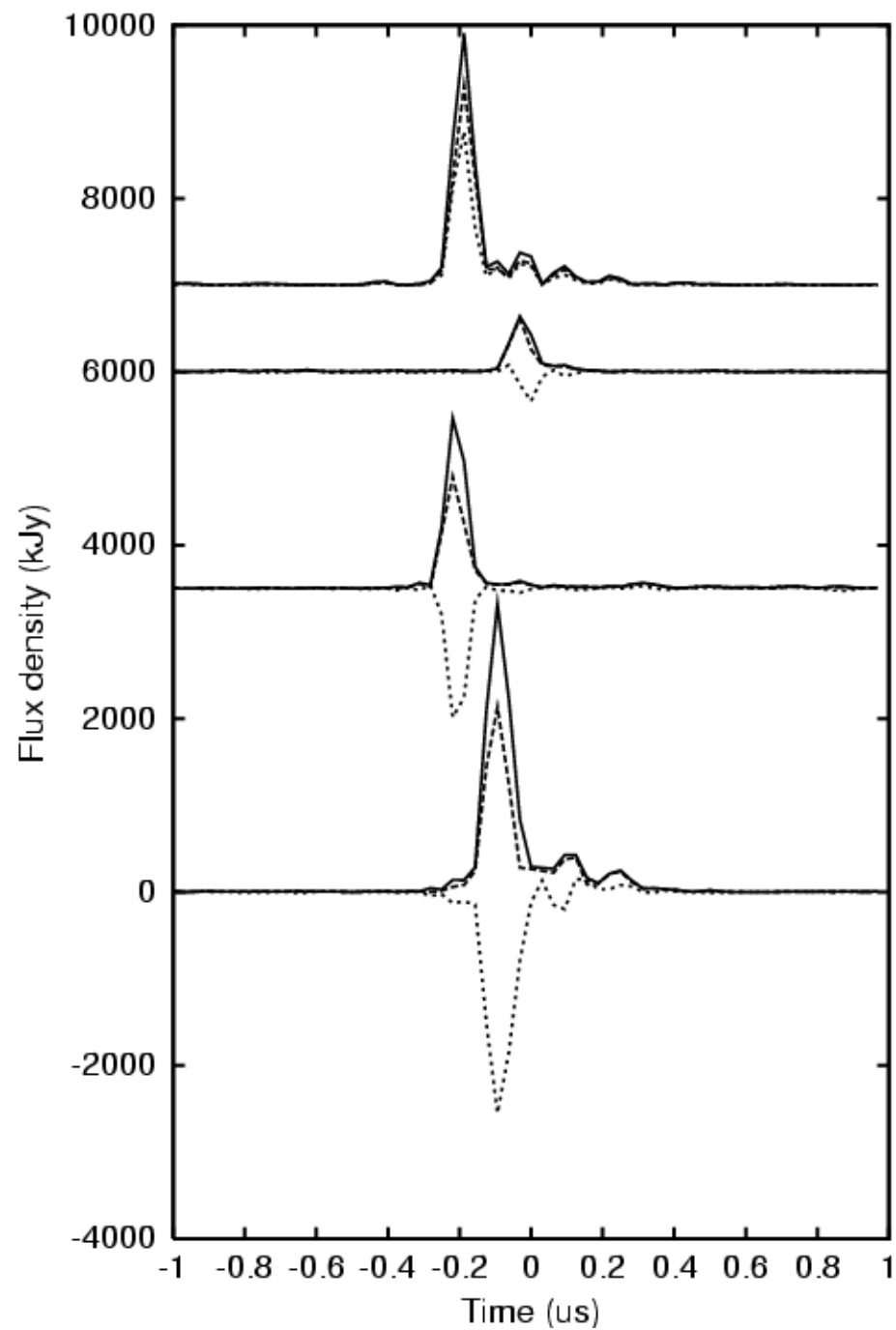
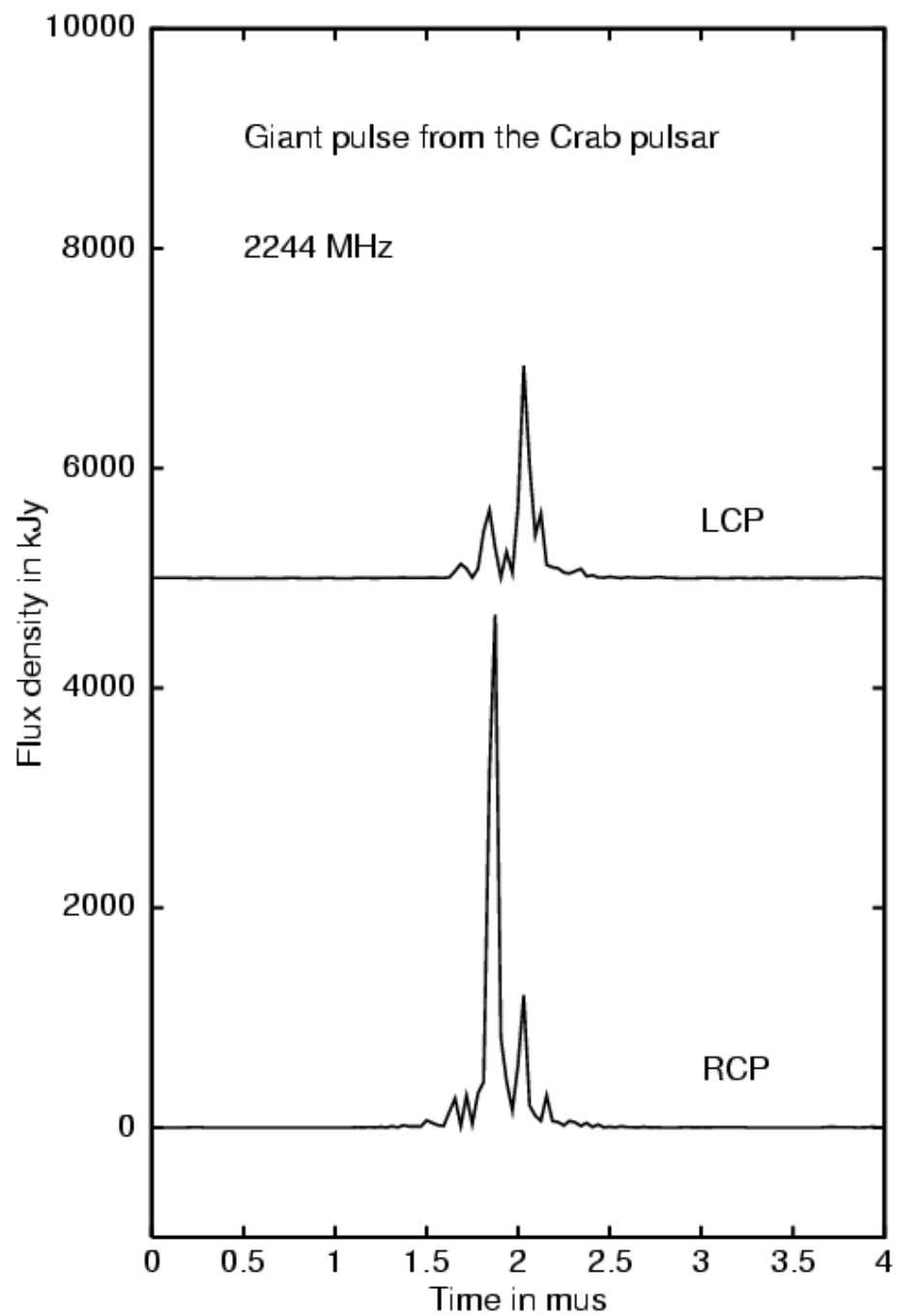


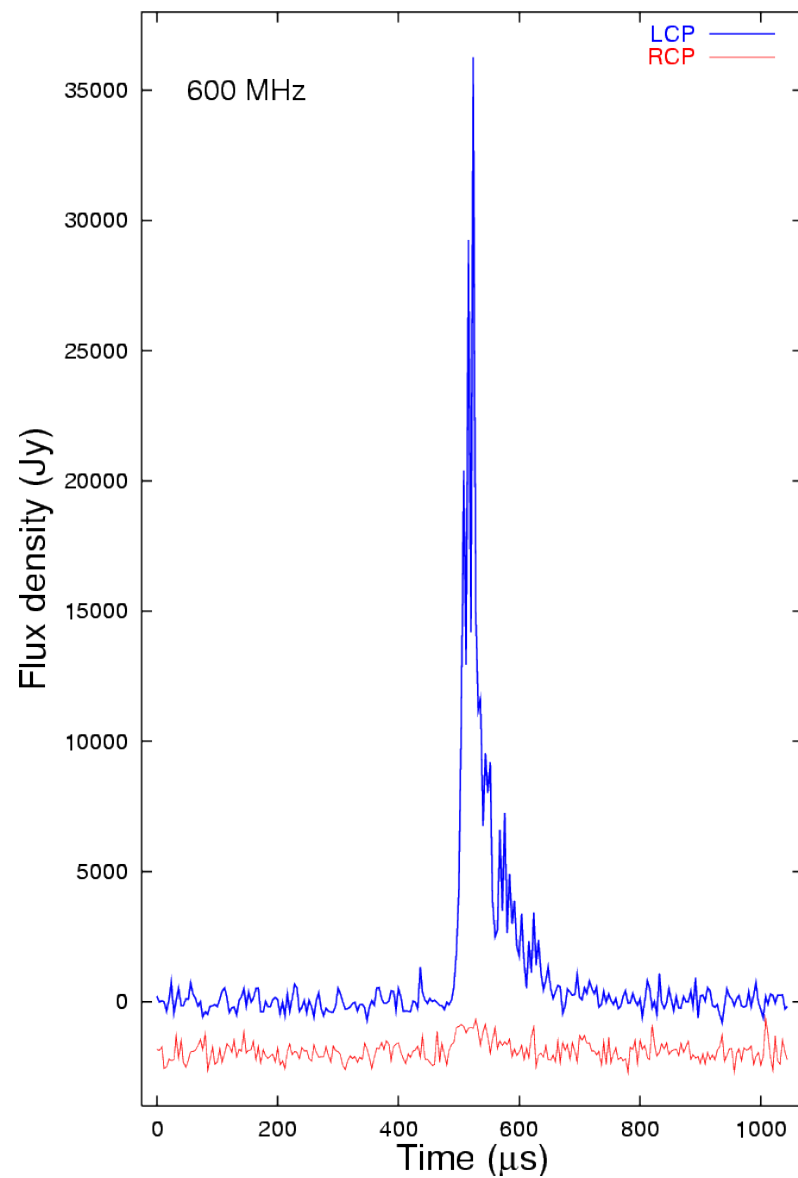
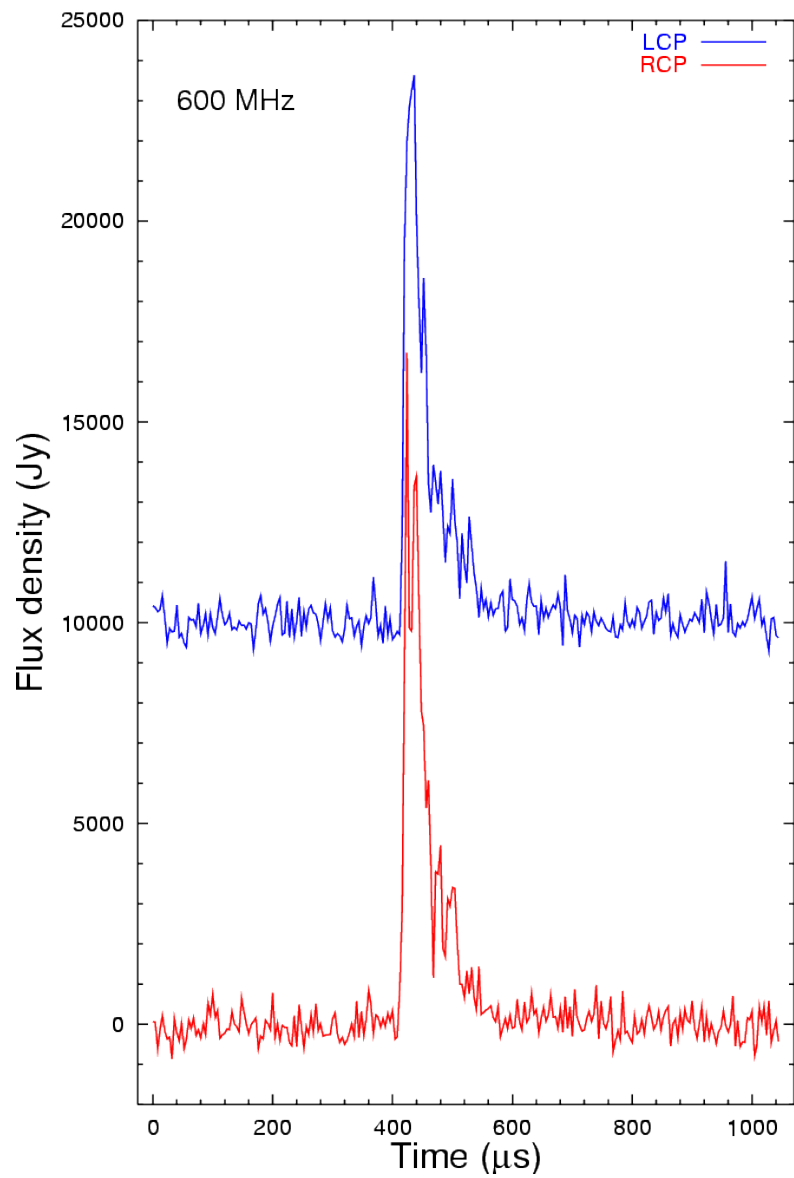
Мегамазеры



Пульсары

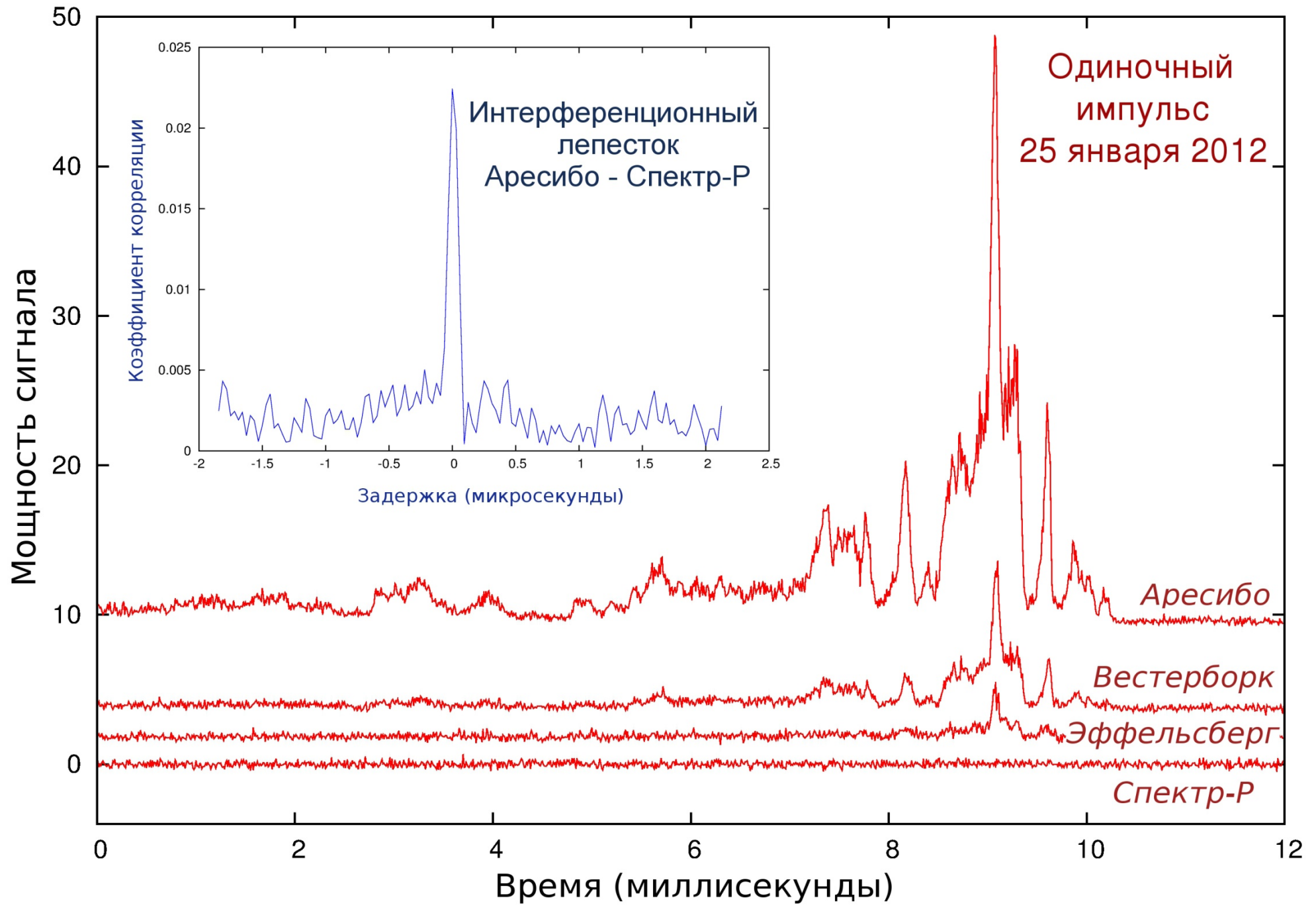




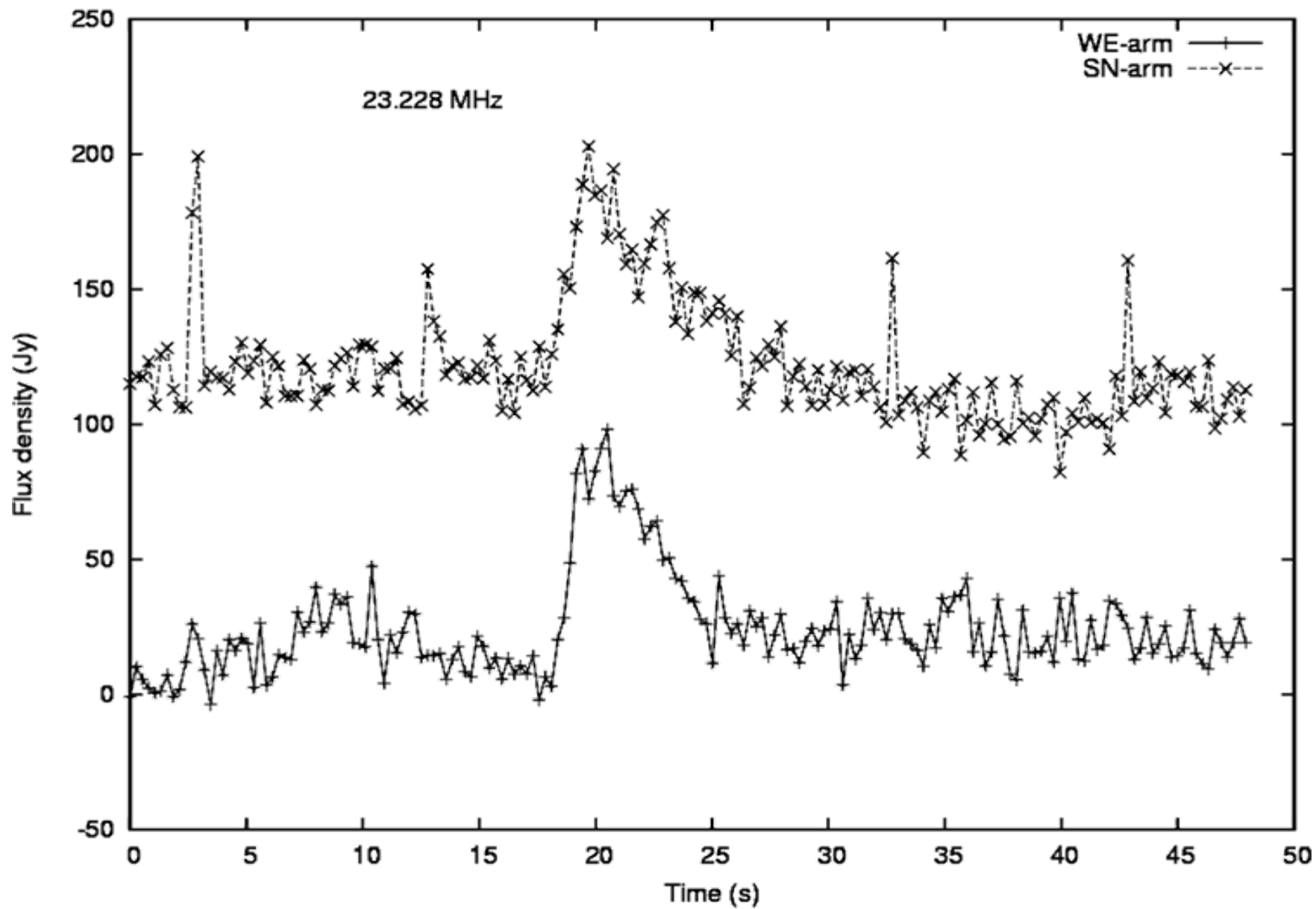


РадиоАстрон: наблюдения пульсара B0950+08 на 92 см

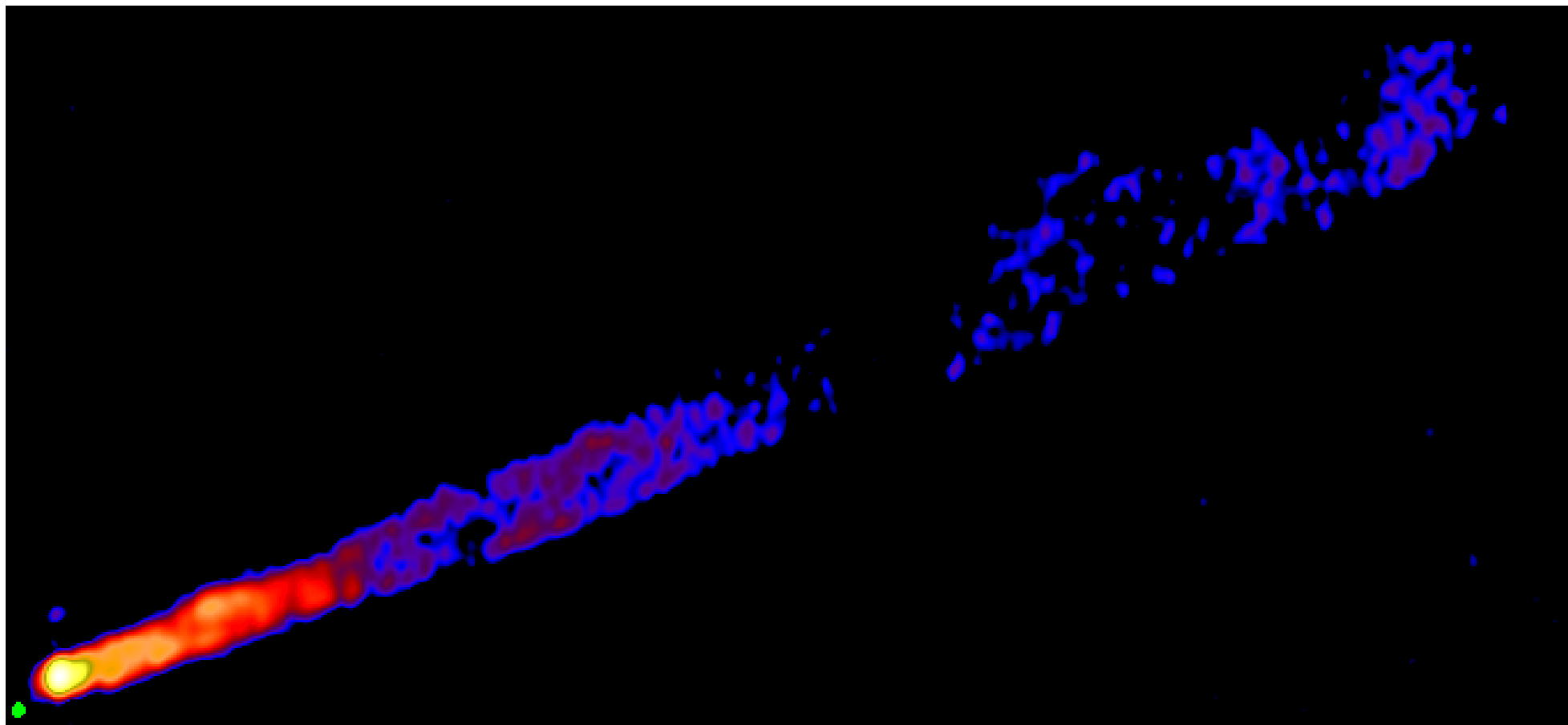
Проекция базы интерферометра 220 000 км

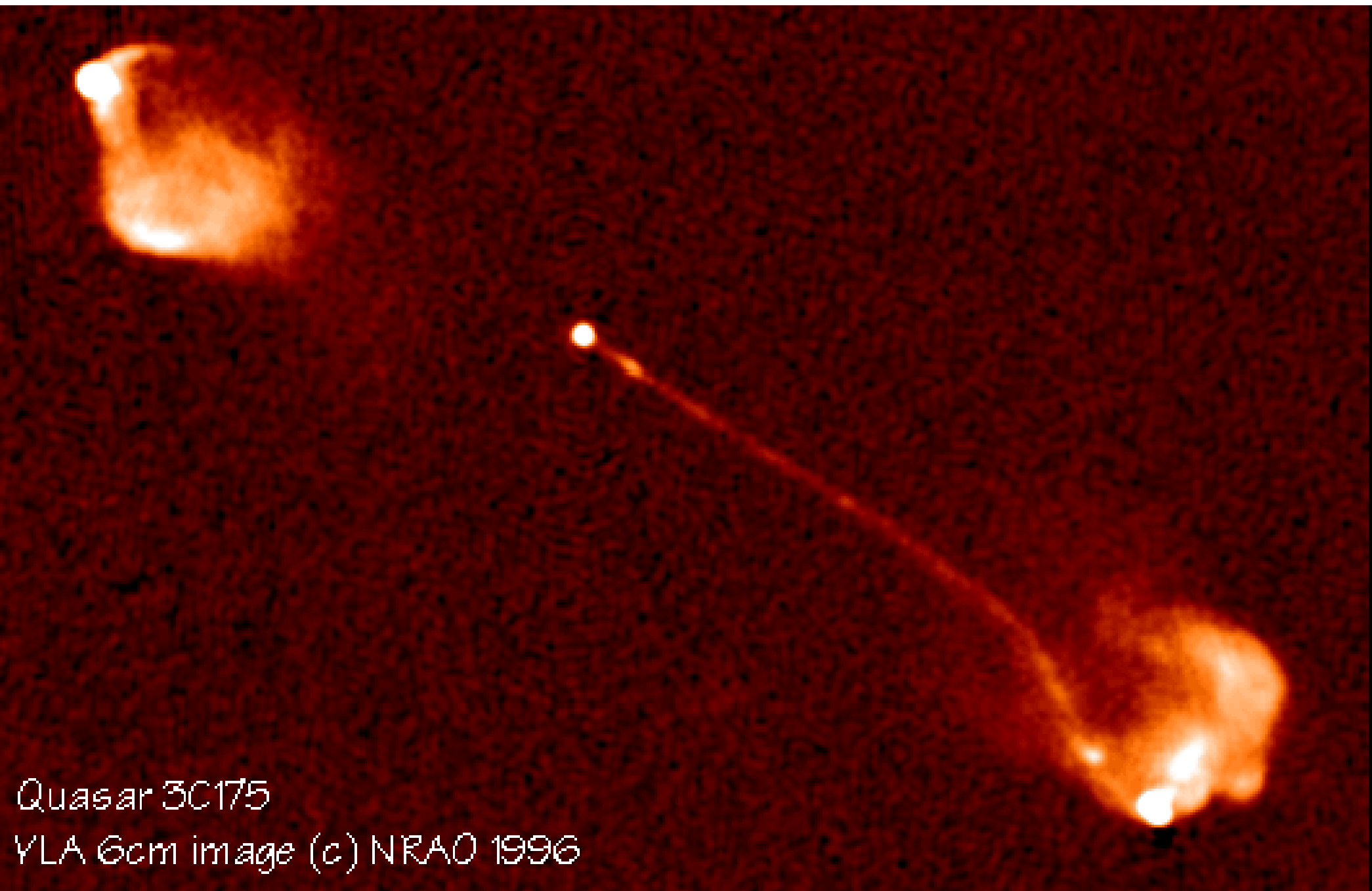


Дисперсия



Активные ядра галактик





Quasar 3C175
YLA 6cm image (c) NRAO 1996



Какие параметры можно получить из наблюдений?

- Плотность потока
- Размер
- Положение деталей
- Спектр
- Мера фарадеевского вращения

Размер

$$r = c \cdot \Delta t$$

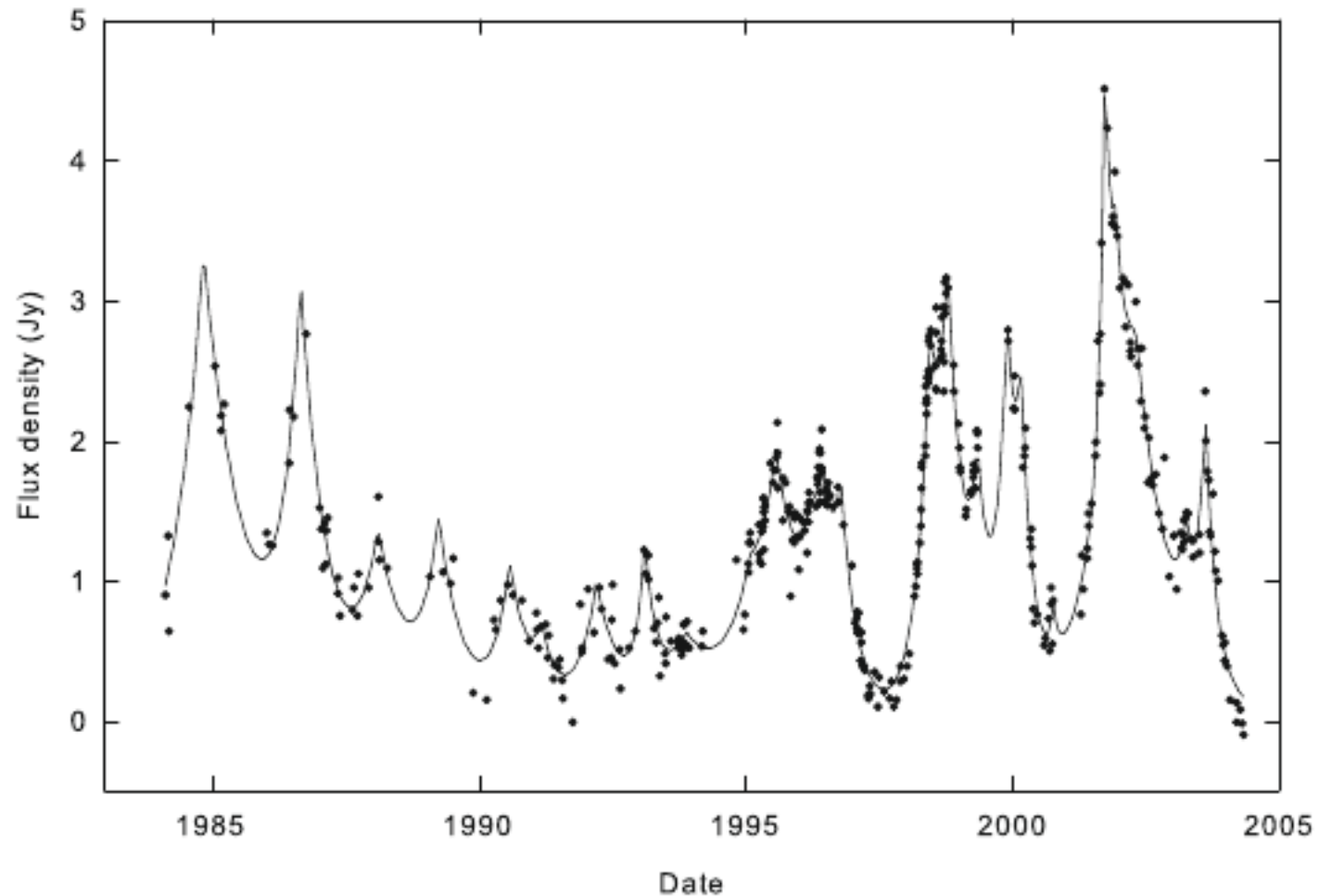
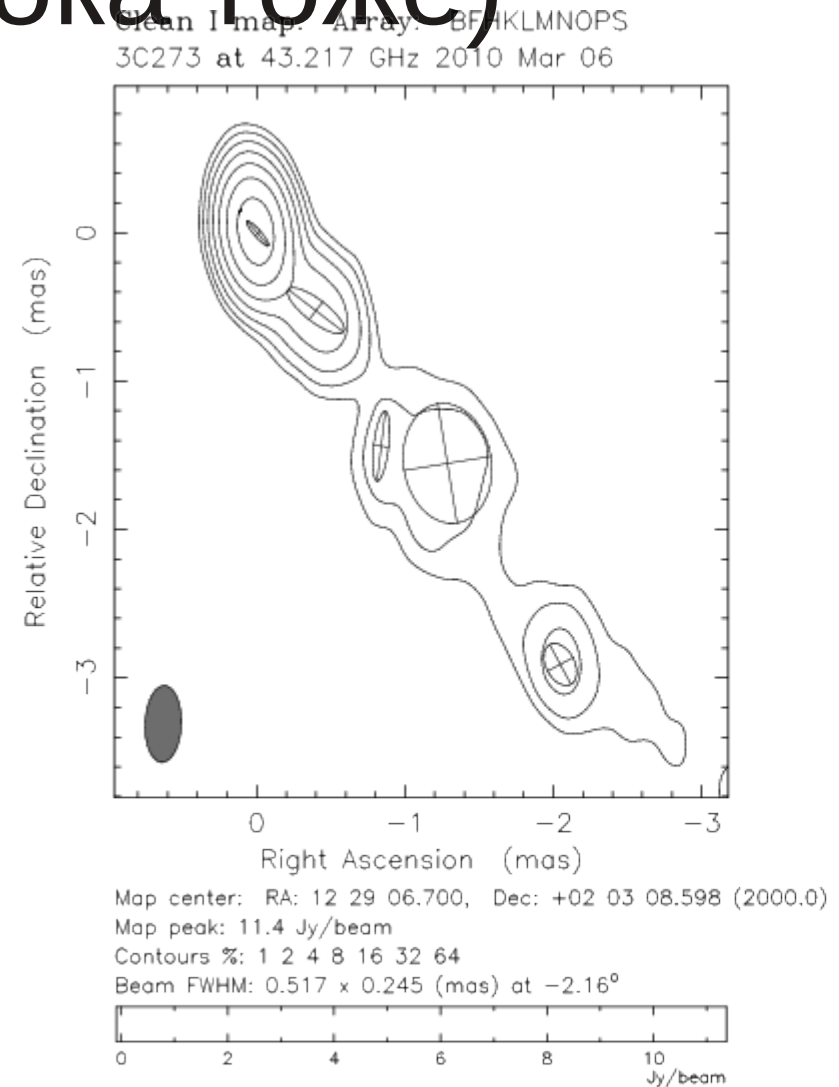
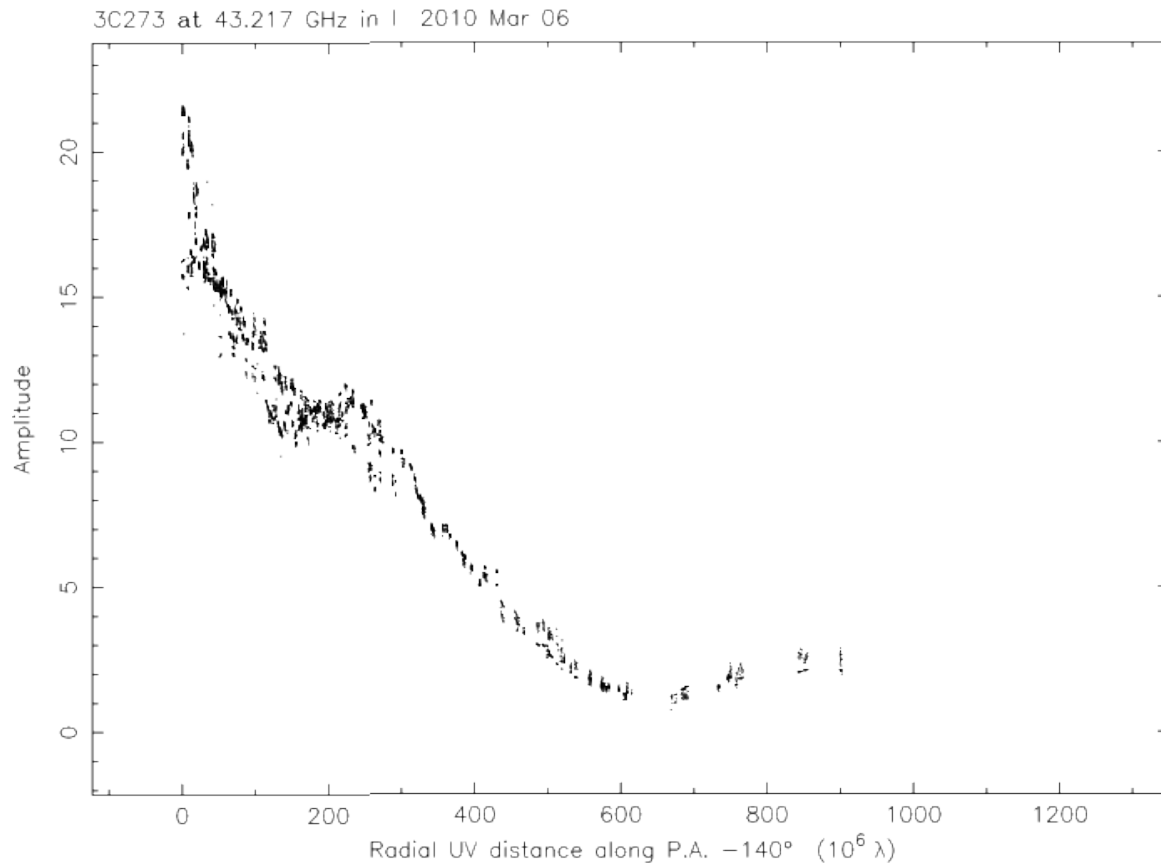


Fig. 1. Flux curve of the HPQ source 1156+295 (points) decomposed into exponential flares (solid line) at 22 GHz.

Размер и положение деталей (да и плотности потока тоже)



Положение деталей - кинематика

