Statistics and Fitting Analysis
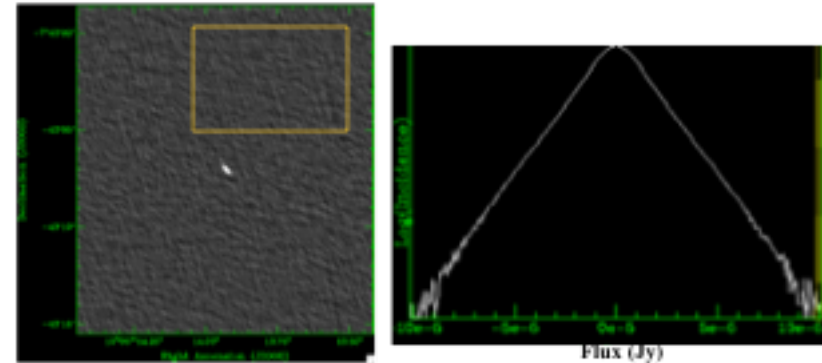
- Basic statistics
  - Error propagation

- Fitting a function (regression)
  - Least squares method

- Judging a fit (χ^2, reduced χ^2)
  - χ^2, reduced χ^2, R^2

- Practical applications of the above.
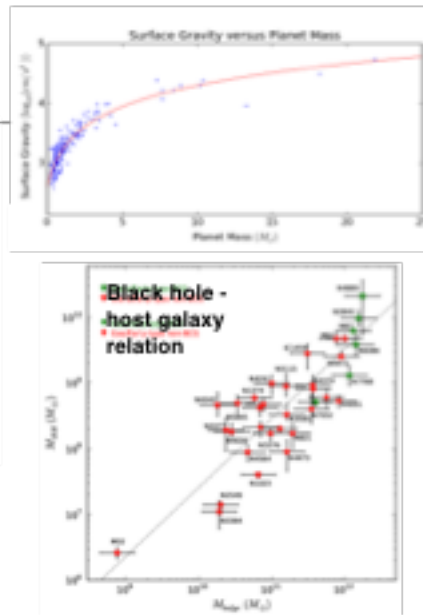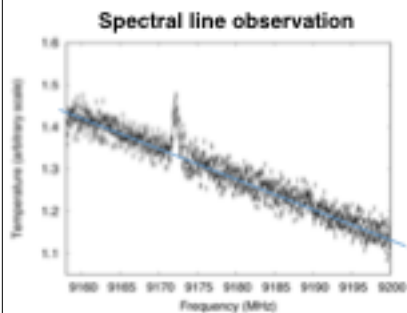
1

Estimating error

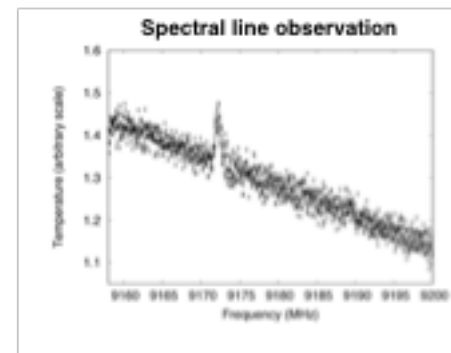**Variance of "blank sky" distribution can give measurement error!**
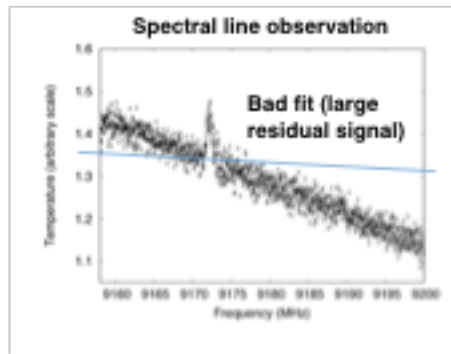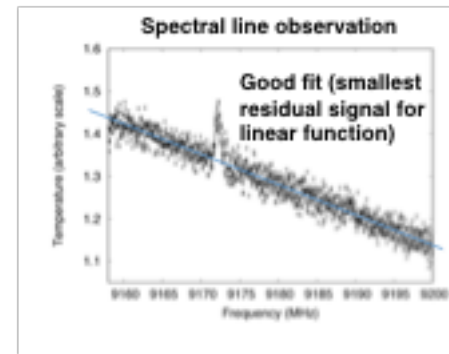
2

Regression

3

Regression

4

Regression

Spectral line observation

Bad fit (large residual signal)

5

Regression

Spectral line observation

Good fit (smallest residual signal for linear function)

6