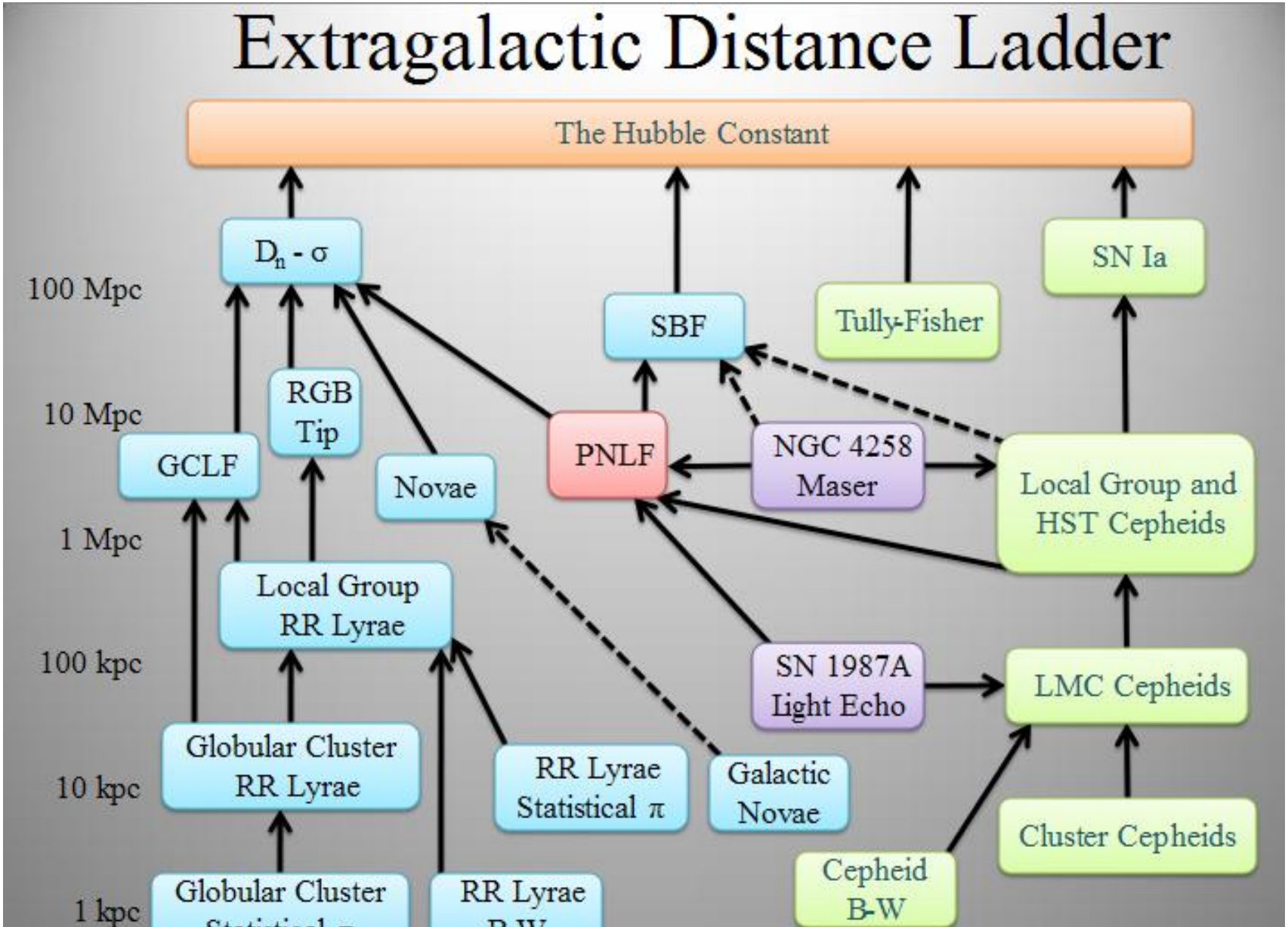
Fitovanje ili prebrojavanje:

primer na uzorku planetarnih maglina

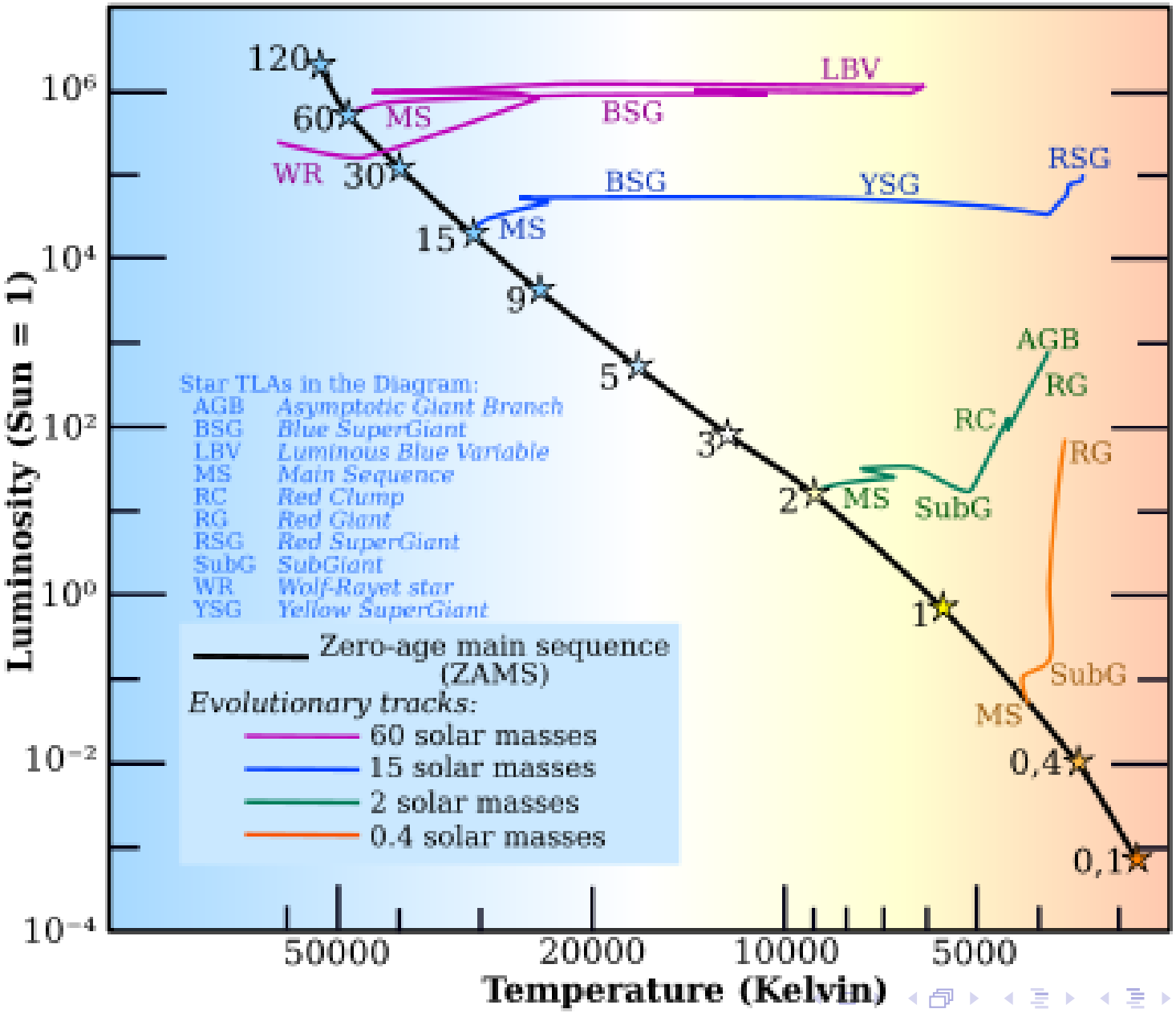
Branislav Vukotić, Astronomska opservatorija
bvukotic@aob.rs

08.05.2012.

Daljine


Extragalactic Distance Ladder
The Hubble Constant
D_n - σ
SBF
Tully-Fisher
SN Ia
100 Mpc
10 Mpc
1 Mpc
100 kpc
10 kpc
1 kpc
RGB Tip
GCLF
Novae
PNLF
NGC 4258 Maser
Local Group and HST Cepheids
Local Group RR Lyrae
SN 1987A Light Echo
LMC Cepheids
Globular Cluster RR Lyrae
RR Lyrae Statistical π
Galactic Novae
Cluster Cepheids
Cepheid B-W
Globular Cluster
RR Lyrae

"Planetarne" magline (AGB magline)



$\Sigma - D$ statističke daljine

Shklovsky, J.S, 1956, H_β emisija iz jonizovane ljuske koja se širi.

$$D = 149 \left[\frac{M^2 j_\beta(T)}{\epsilon j_\beta(T)} \right] \theta_r{}^{-3/5} S_\beta^{-1/5}$$

$$\Sigma_\nu = \frac{S_\nu}{\Omega}, \quad \Omega = (\frac{D}{d})^2, \quad D = \theta d$$

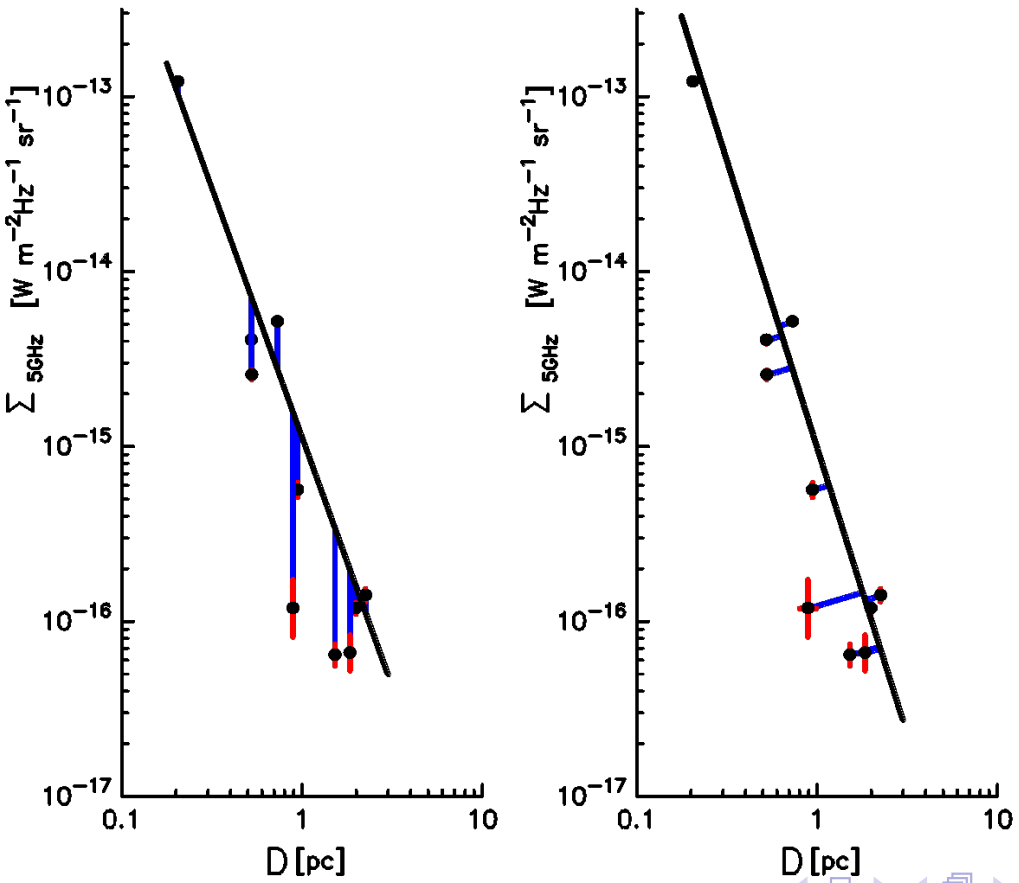
$$\Sigma = AD^\beta$$

$$R - T_\mathrm{b} \text{ i } \mu - \tau$$

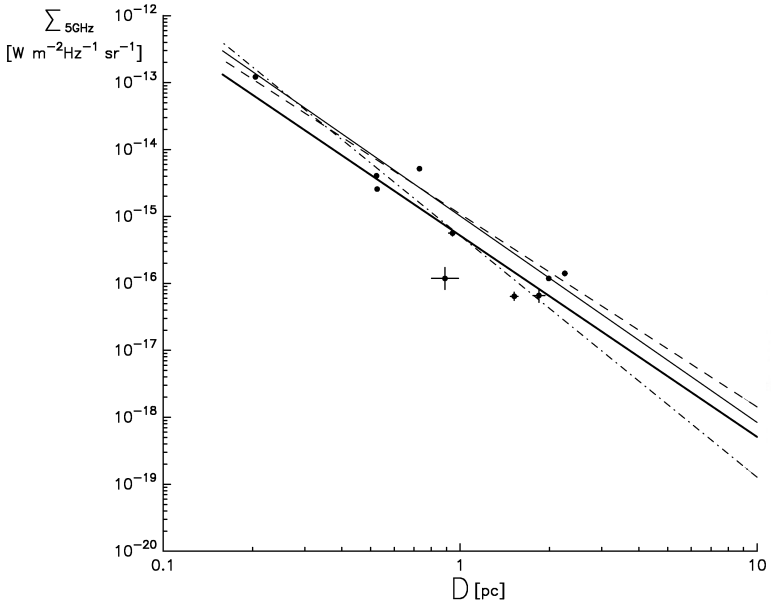
Tip fita

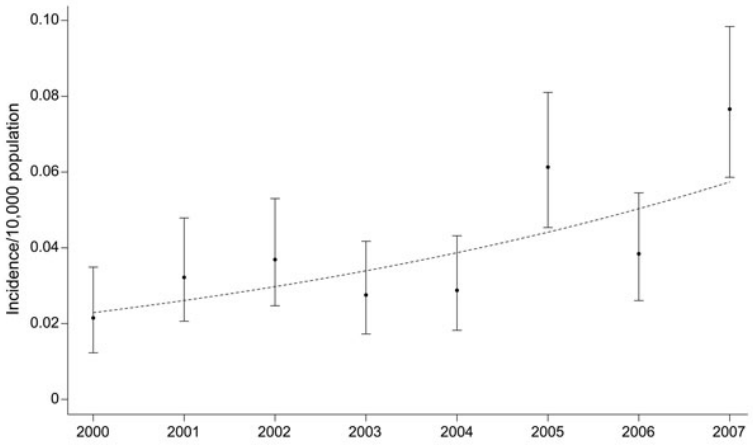
$$\Sigma = A' D^{\beta}, \quad D = B' \Sigma^{\alpha}$$
$$\log \Sigma = a + b \log D,$$

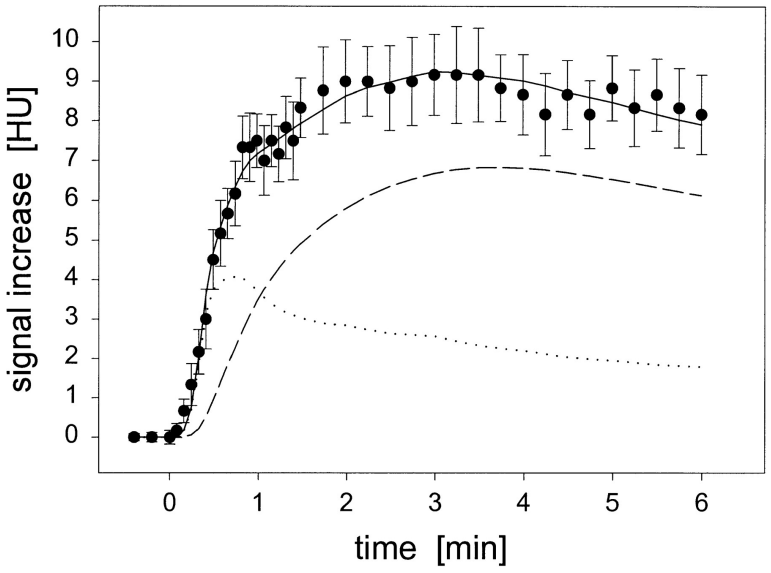
$$d = \frac{|y_i - a - b x_i|}{\sigma_{y_i}}, \; d = \frac{|y_i - a - b x_i|}{(\sigma_{y_i}^2 + \sigma_{x_i}^2 b^2)^{0.5}}$$

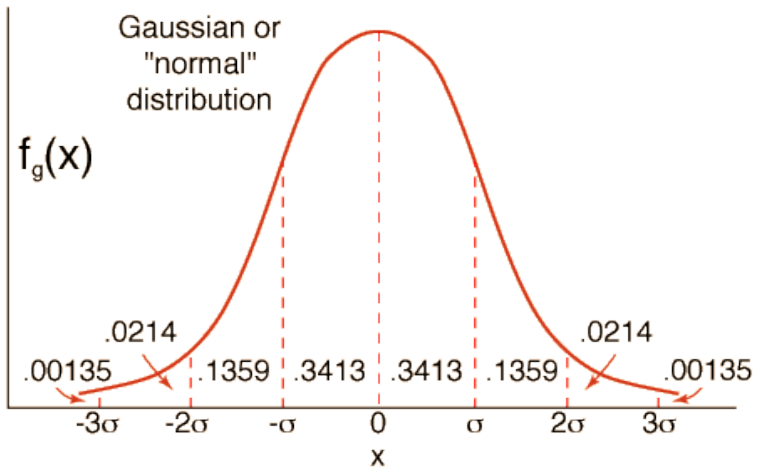


Statistika fita.

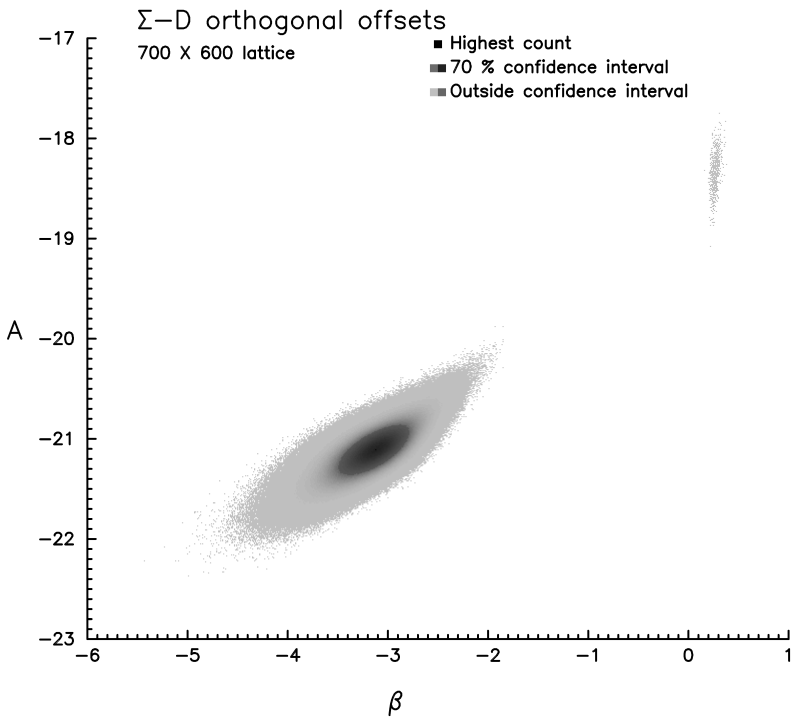


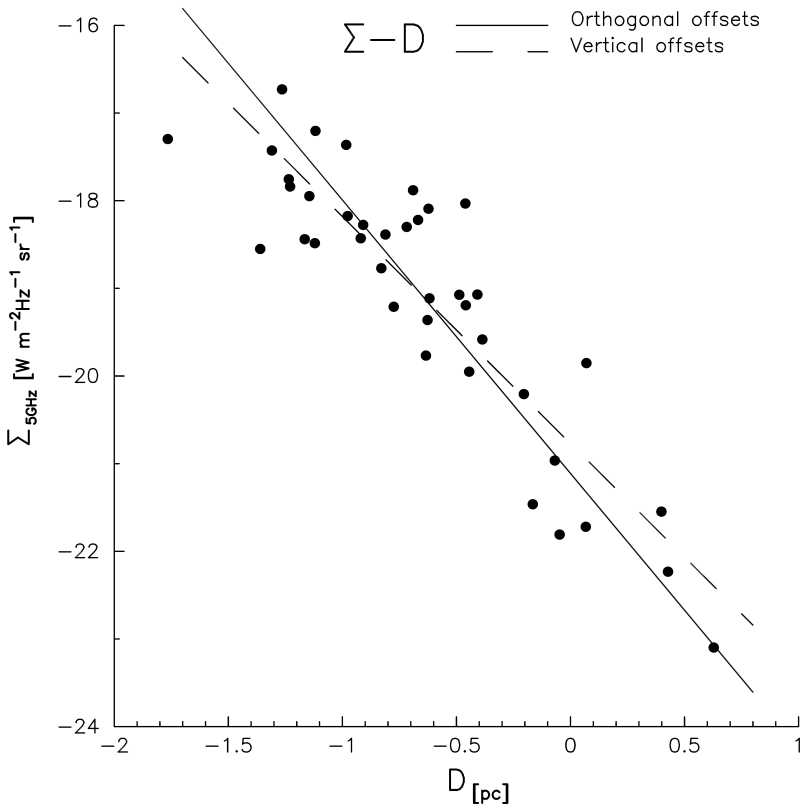






Butstrap i netežinsko fitovanje. Opet uz gubitak informacije.





Vert: $A = -20.74, \quad \beta = -2.56, \quad ferr = 0.55.$

Perp: $A = -21.14, \quad \beta = -3.14, \quad ferr = 0.48.$

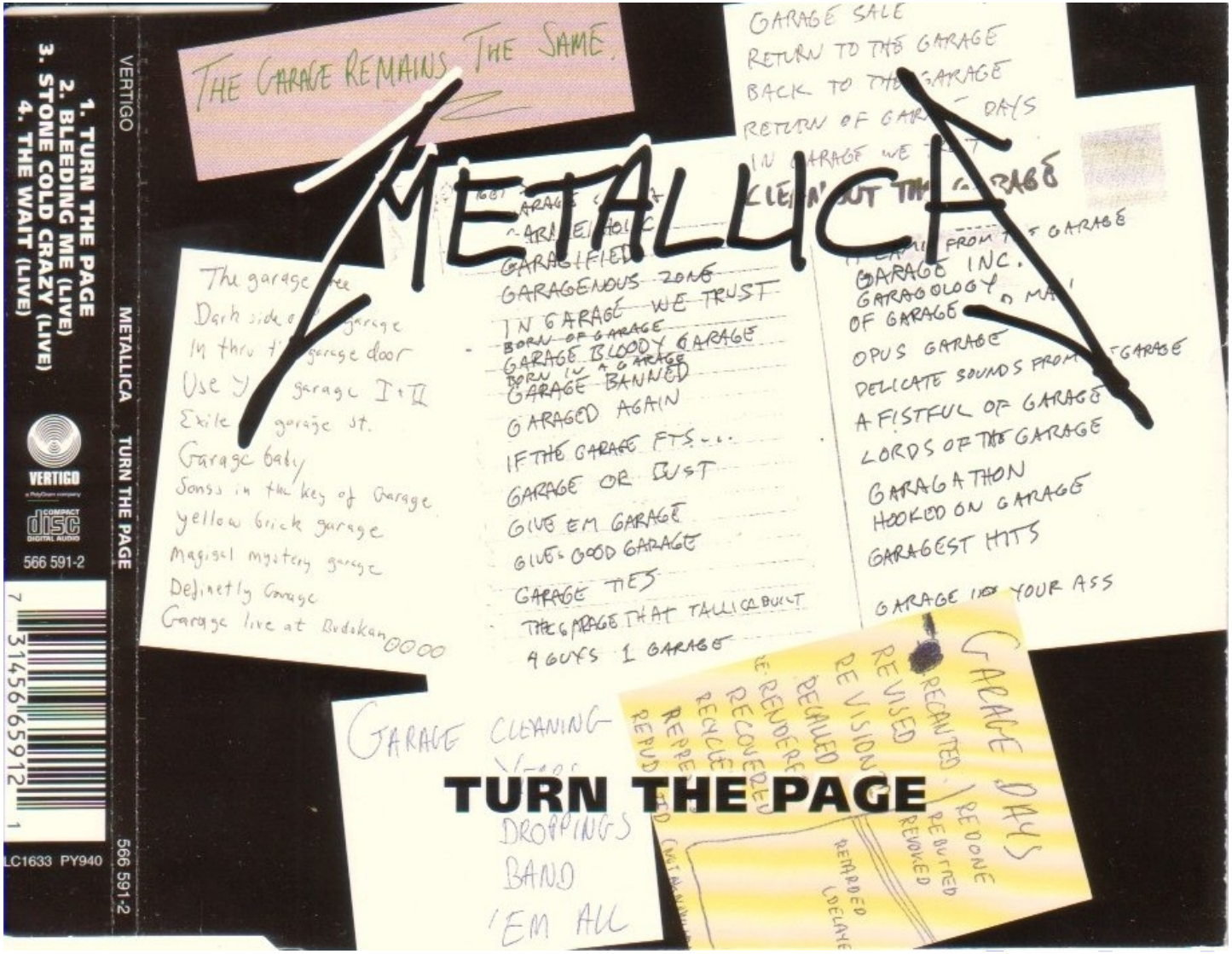
Slučaj planetarnih maglina

Title: Shapes and Shaping of Planetary Nebulae
Authors: Balick, Bruce; Frank, Adam
Publication: Annual Review of Astronomy and Astrophysics, Vol. 40, p. 439-486 (2002) (Annual Reviews Homepage)

Abstract. We review the state of observational and theoretical studies of the shaping of planetary nebulae (PNe) and protoplanetary nebulae (pPNe). **In the past decade, high-resolution studies of PNe have revealed a bewildering array of morphologies with elaborate symmetries. Recent imaging studies of pPNe exhibit an even richer array of shapes. The variety of shapes, sometimes multiaxial symmetries, carefully arranged systems of low-ionization knots and jets, and the often Hubble-flow kinematics of PNe and pPNe indicate that there remains much to understand about the last stages of stellar evolution.** In many cases, the basic symmetries and shapes of these objects develop on extremely short timescales, seemingly at the end of AGB evolution when the mode of mass loss abruptly and radically changes. No single explanation fits all of the observations. The shaping process may be related to external torques of a close or merging binary companion or the emergence of magnetic fields embedded in dense outflowing stellar winds. We suspect that a number of shaping processes may operate with different strengths and at different stages of the evolution of any individual object.

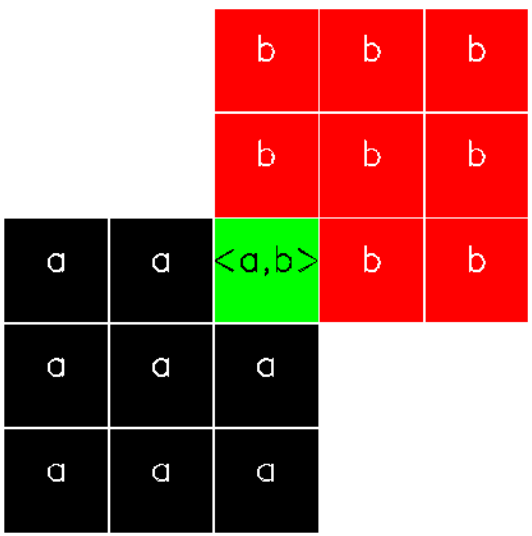
Vreme je da se okrene list!

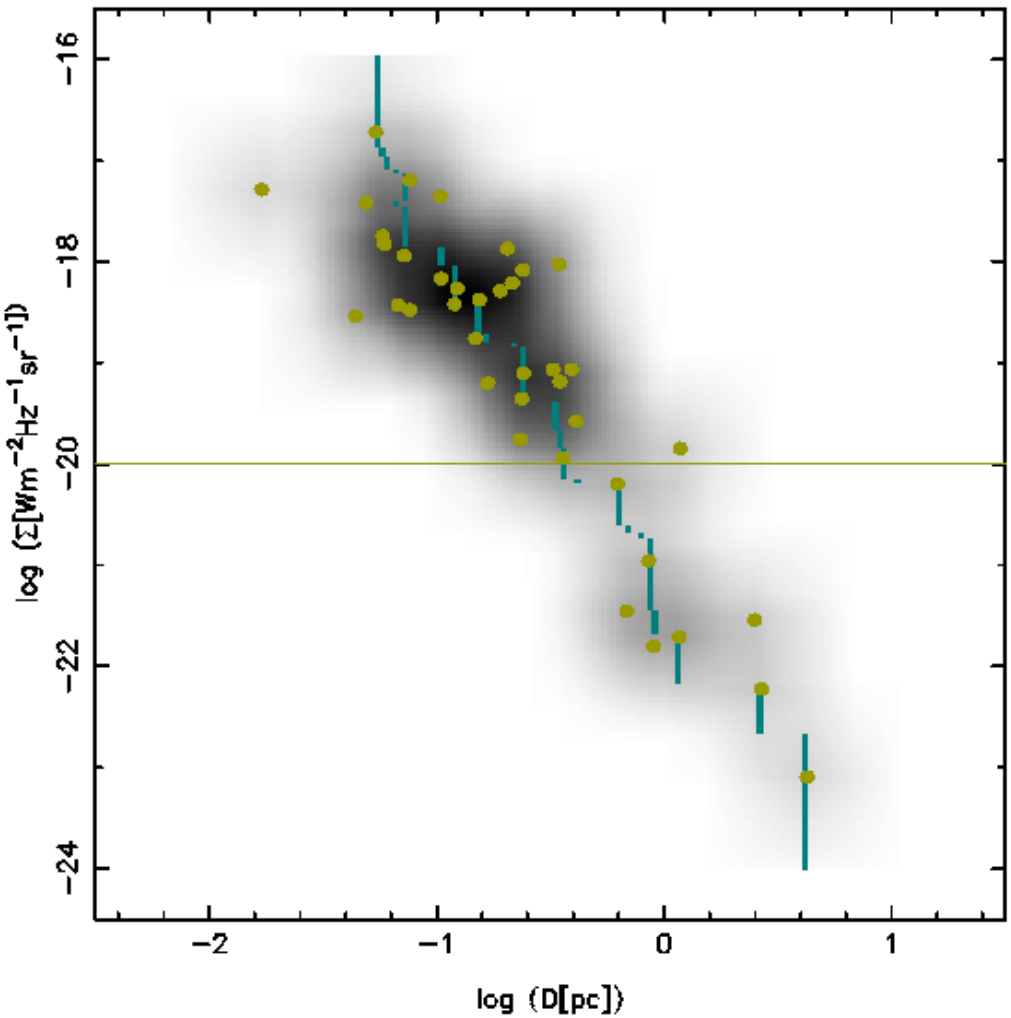
Bez potrebe za određivanjem greški tačaka, bez pp o tipu fita i bez gubitka informacije.



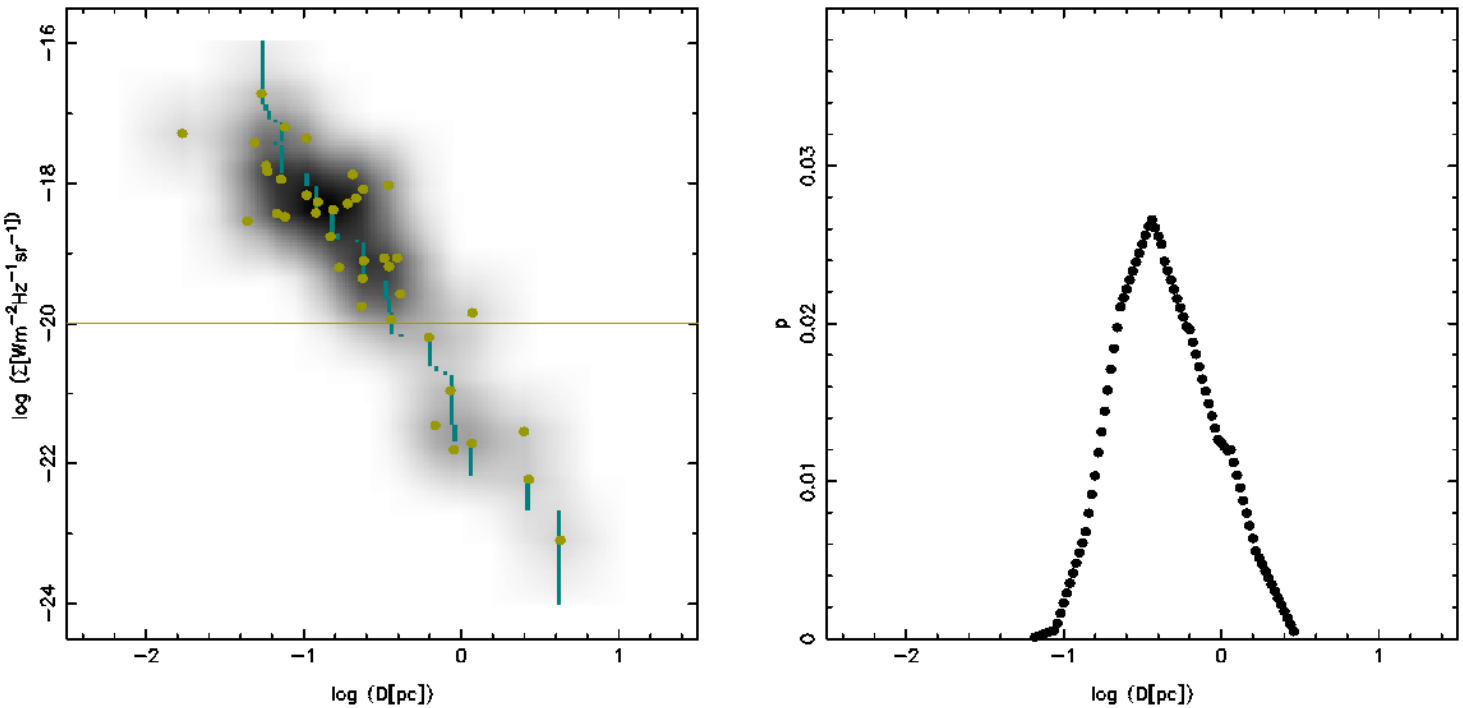
Kako?

Prost *f*requency count u obliku histograma – Origin, ...
Problem kada ima malo tačaka.

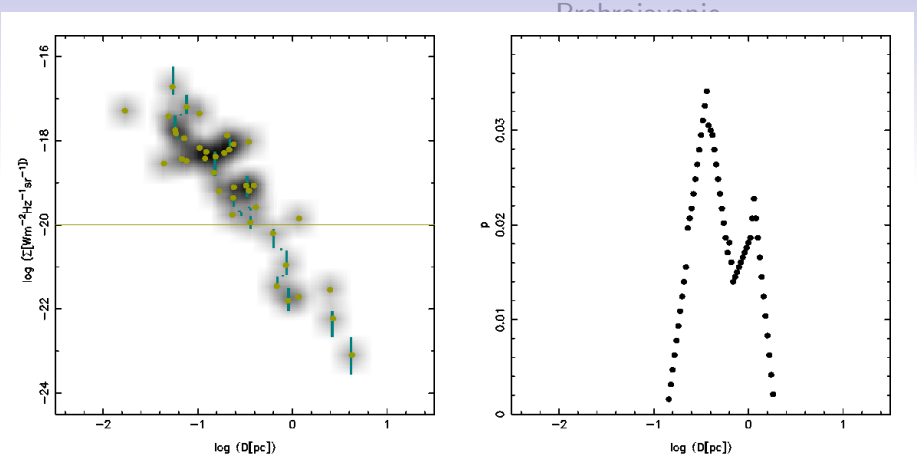




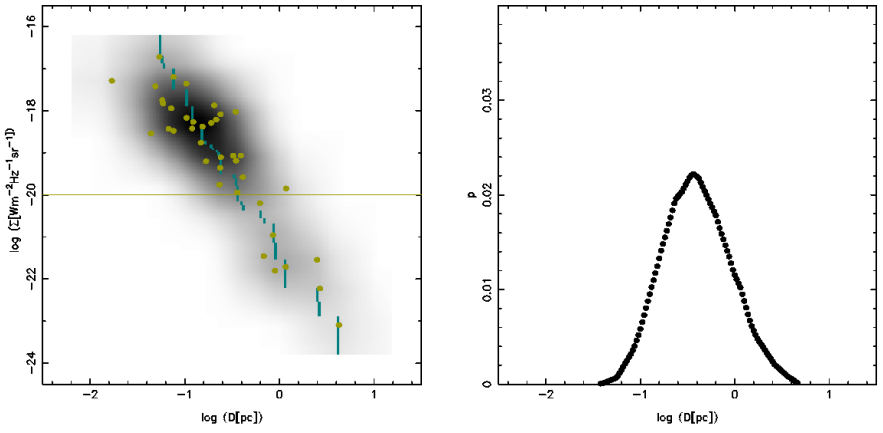
Određivanje dijametra



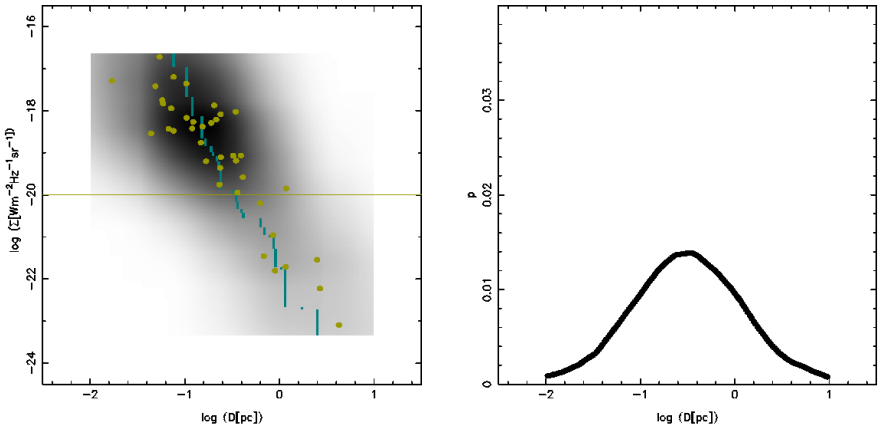
$r = 10, ferr = 0.43$



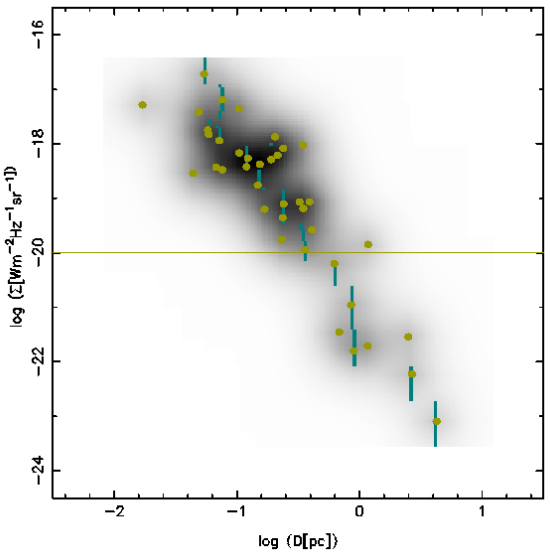
$r = 5, ferr = 0.47$

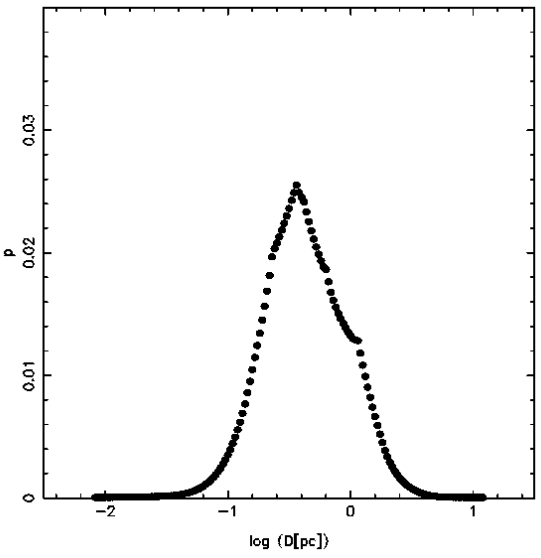


$r = 15, ferr = 0.42$

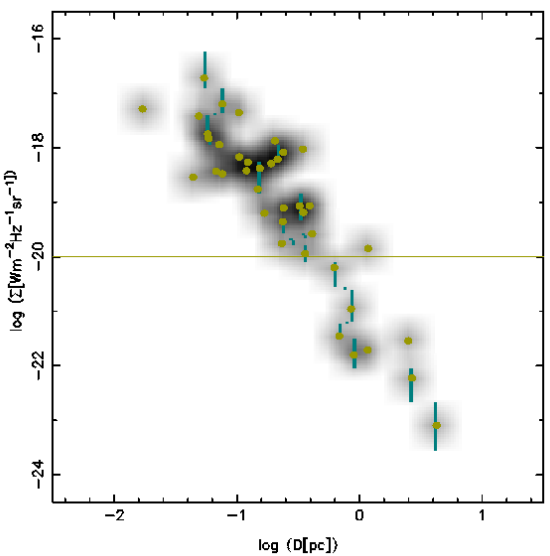


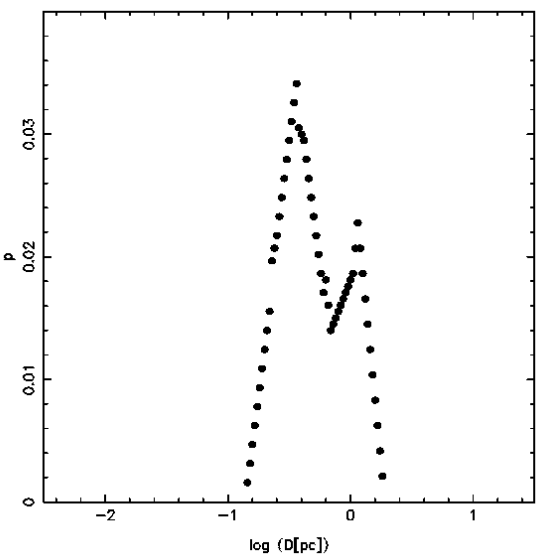
$r = 25, ferr = 0.60$





$r = 5-20, ferr = 0.41$





$r = 5, ferr = 0.47$

Za uraditi

- Uraditi prebrojavanje na „prirodnoj“ skali koja nije logaritamska.
- Naći postupak određivanja veličine okoline.
- ...