



MAX-PLANCK-GESELLSCHAFT



Max-Planck-Institut
für Radioastronomie

Shock–Shock Interaction in the Jet of CTA 102

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April 13th, 2011

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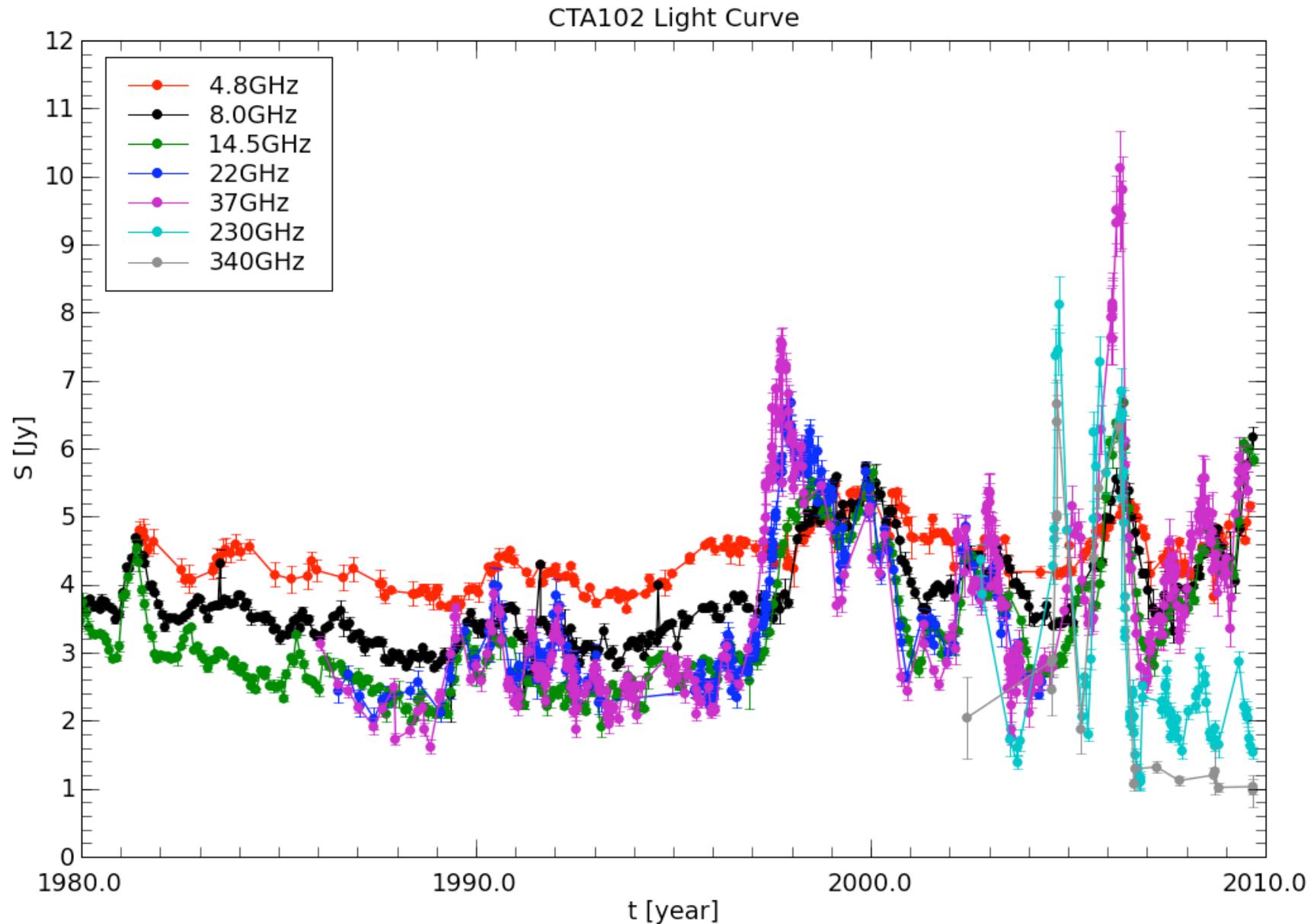
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² University of Valencia



IMPRS
astronomy &
astrophysics
Bonn and Cologne

Single Dish Light Curve



Ref: H. Aller & M. Aller (2009), Teräsranta et al. (2005), A.
Lähteenmäki (2009)
M. Gurwell (2009)

Spectral Fitting

Total spectrum

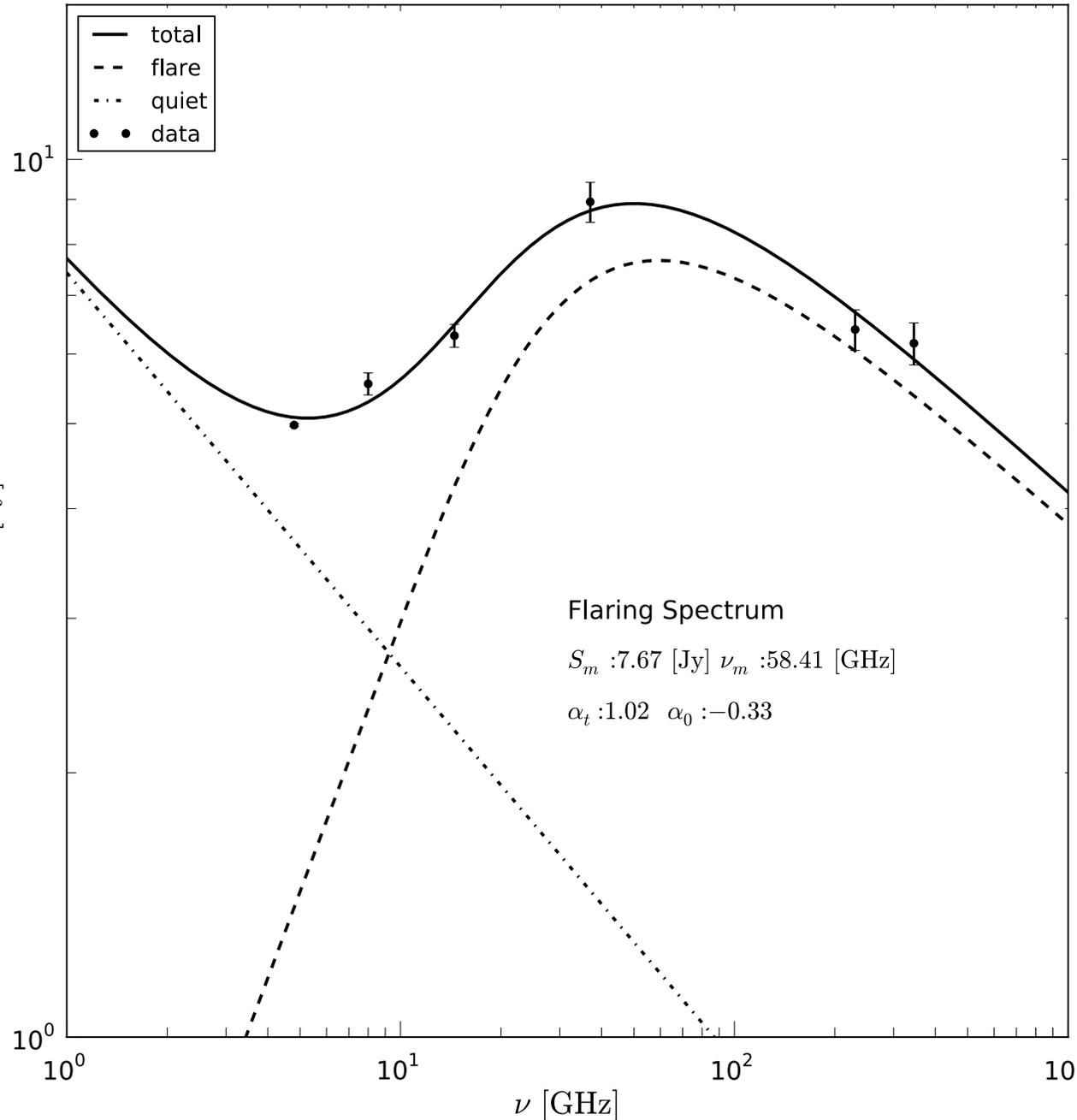
spectrum

$$S_{\nu,t} = cl$$

S [Jy]

with

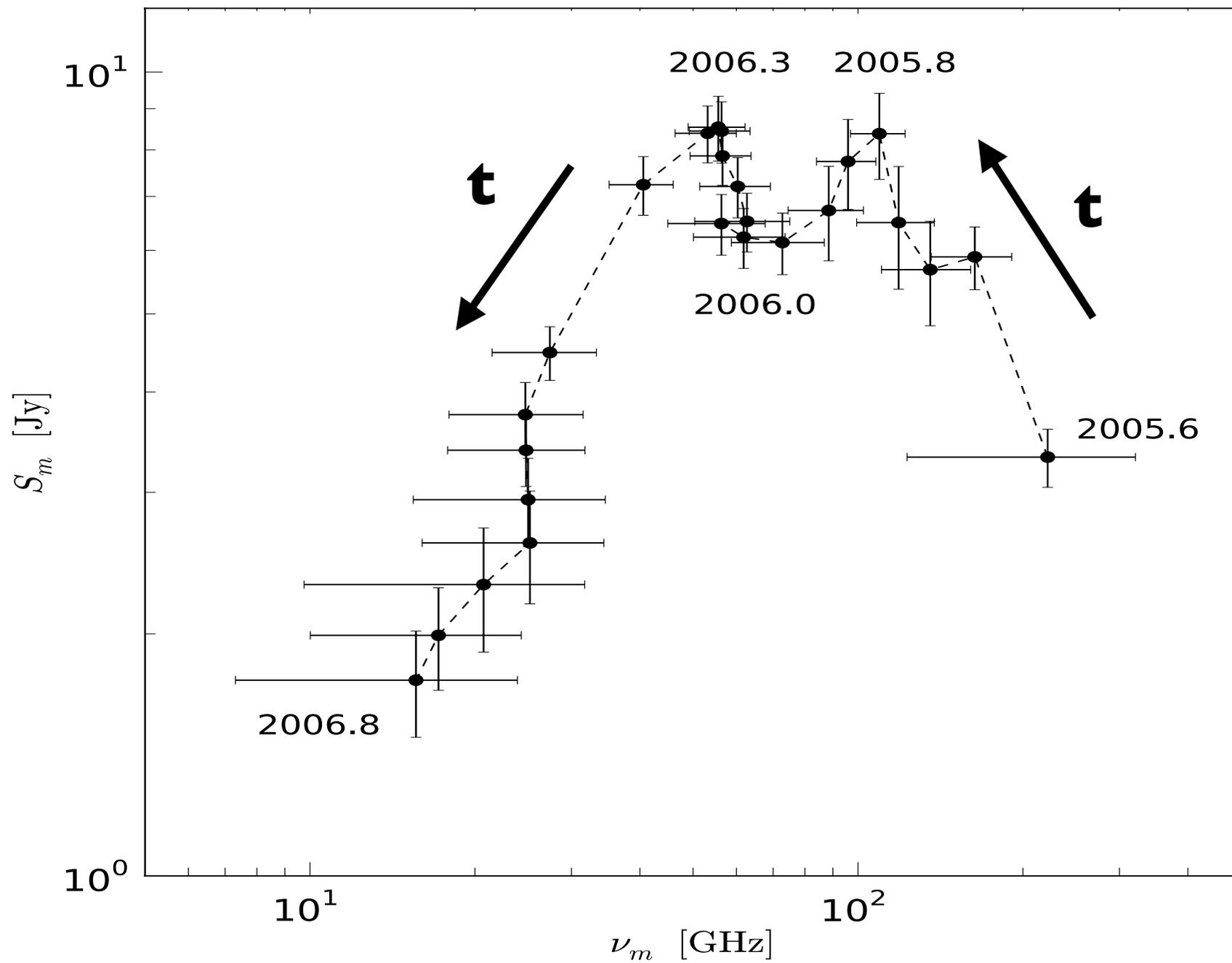
$$-1.2 < \alpha_t$$



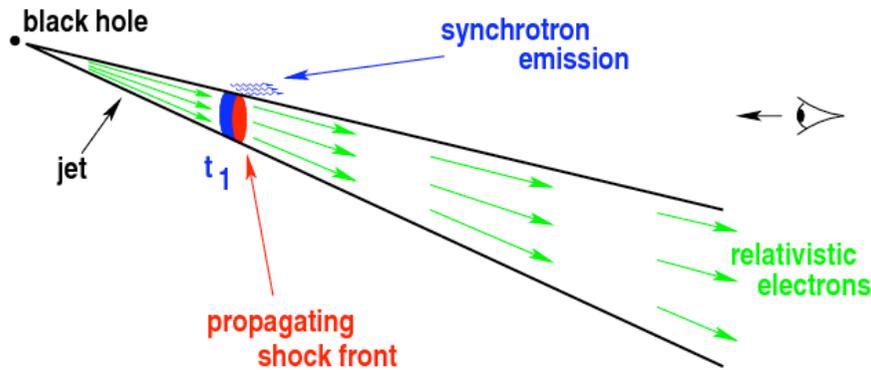
$$\frac{c l \left(\frac{8\alpha_0}{3\alpha_t} - 1 \right)}{\nu^{\alpha_0 - \alpha_t}}$$

$$\frac{8\alpha_0}{3\alpha_t} - 1$$

Results



Shock-in-Jet Model

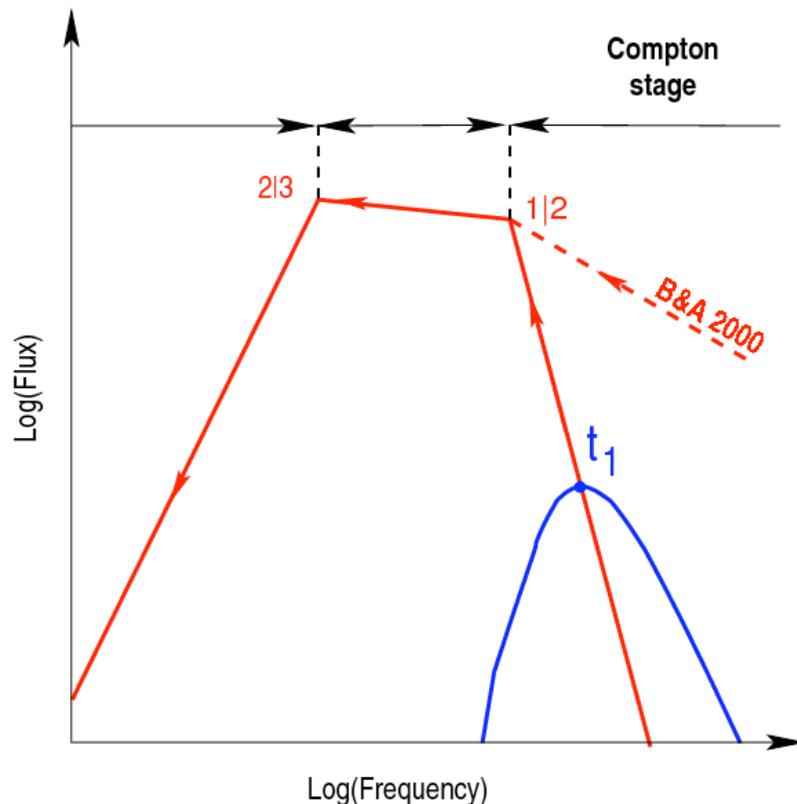


Assumptio

$$N(\gamma) = K \gamma^{-s} \quad \gamma_{\min} < \gamma < \gamma_{\max}$$

$$K \propto R^{-k} \quad B \propto R^{-b}$$

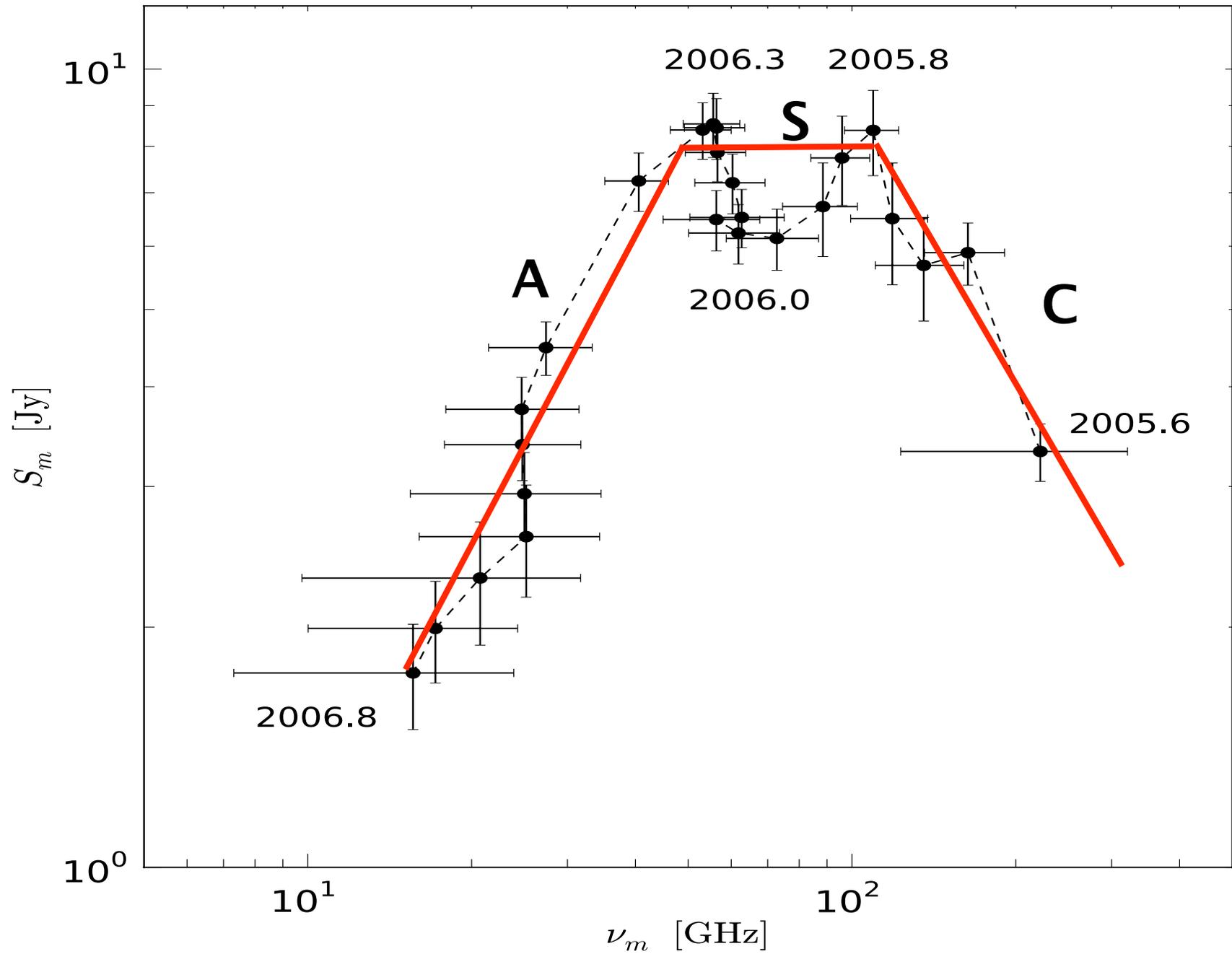
$$R \propto L^r \quad D \propto R^{-d}$$



$$S_m \propto \nu_m^f(s, k, b, d, r)$$

Ref: Marscher & Gear (1985), Tuerler et al. (2000)

Modeling



Results & Interpretation

	2005.60–2005.95 C1A1	2005.95–2006.30 C2	2006.30–2006.80 A2
b	$1.0^{+0.08}_a$	$1.35^{+0.65}_{-0.35}$	1.7 ± 0.2
d	0.2 ± 0.02	-0.1 ± 0.03	$-0.2^{+0.08}_{-0.05}$
s	2.1	2.0	2.4
k	2.7 ± 0.14	not fitted	4.7 ± 0.4
r	0.60 ± 0.03	0.35 ± 0.02	0.90 ± 0.07

