

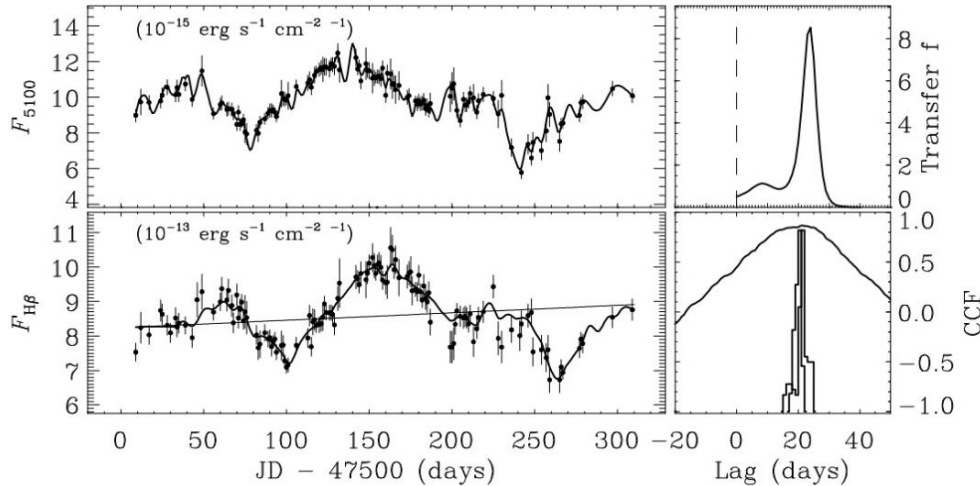
Applicate Maximum Entropy Method to SEAMBH2012

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Yunnan Observatories (CAS)
SEAMBH collaborator

Reverberation Mapping

$$\Delta L(V, t) = \int_0^{\infty} \psi(V, \tau) \Delta C(t - \tau) d\tau$$

Velocity-delay map



NGC 5548
Peterson 2002

AGN Reverberation Mapping: the pc Scale Garden of Massive Black Holes

October 24-26, Lijiang, China

<http://indico.ihep.ac.cn/e/AGN>

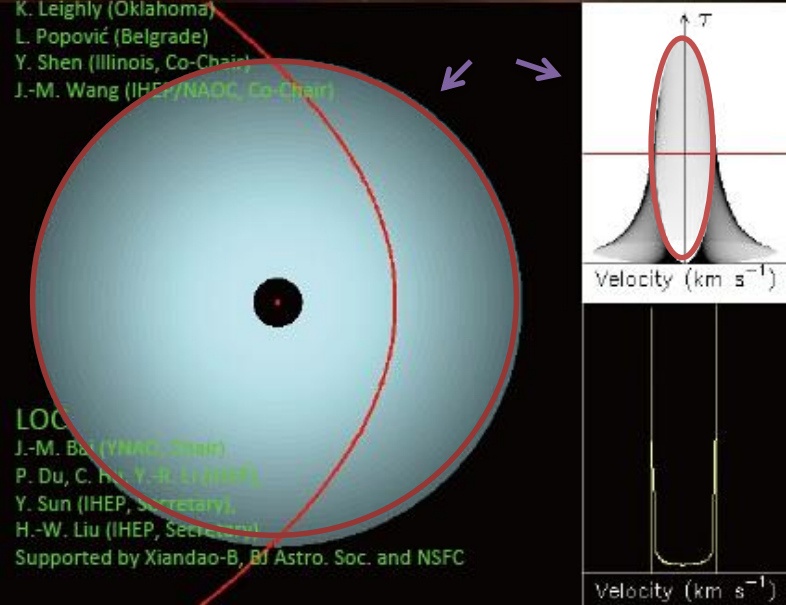
SOC

- A. Barth (UC, Irvine)
- B. Czerny (CAMK, Co-Chair)
- L.C. Ho (KIAA, PKU)
- S. Hoenig (Southampton)
- W. Kollatshny (Göttingen)
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- K. Leighly (Oklahoma)
- L. Popović (Belgrade)
- Y. Shen (Illinois, Co-Chair)
- J.-M. Wang (IHEP/NAOC, Co-Chair)

Velocity-delay map ↓

LOC

- J.-M. Bai (YNAO, Chair)
 - P. Du, C. He, Y.-R. Li (IHEP)
 - Y. Sun (IHEP, Secretary)
 - H.-W. Liu (IHEP, Secretariat)
- Supported by Xiandao-B, BJ Astro. Soc. and NSFC

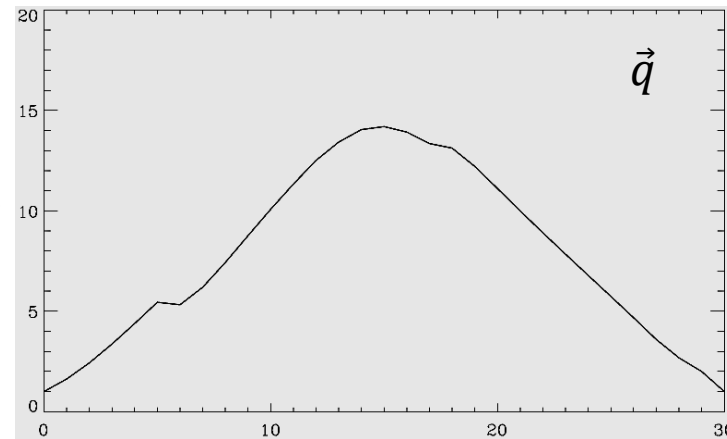
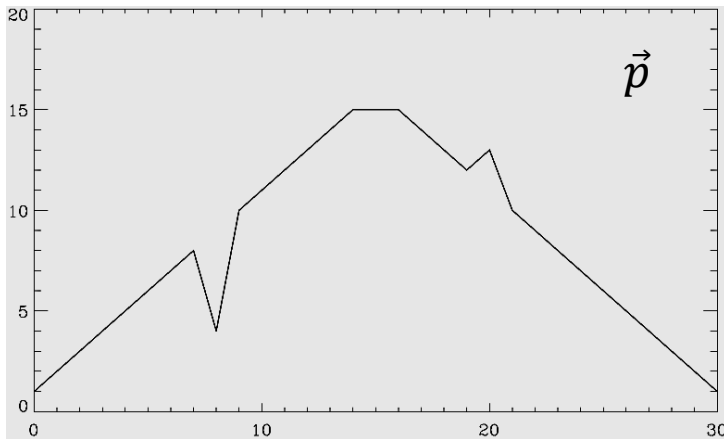


Maximum Entropy Method (MEM)

$$Q^2 \equiv \chi^2(\vec{x}, \vec{p}) - \alpha S(\vec{p}, \vec{q}) \quad | \quad \alpha: \text{control trade-off between } \chi^2 \text{ \& } S$$

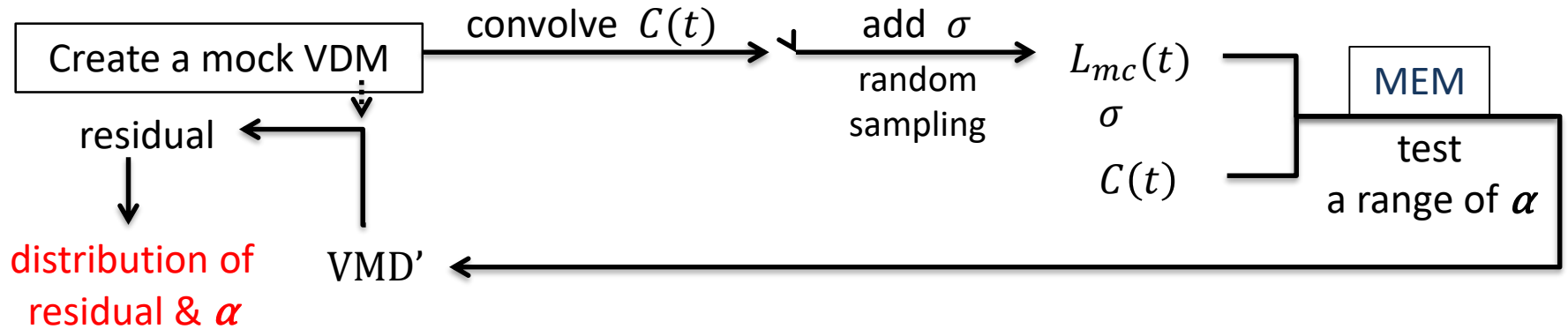
$$S(\vec{p}, \vec{q}) = - \sum_{j=1}^M p_j - q_j - p_j \ln(p_j/q_j)$$

$$q_j = \sqrt{p_{j-1} p_{j+1}}$$

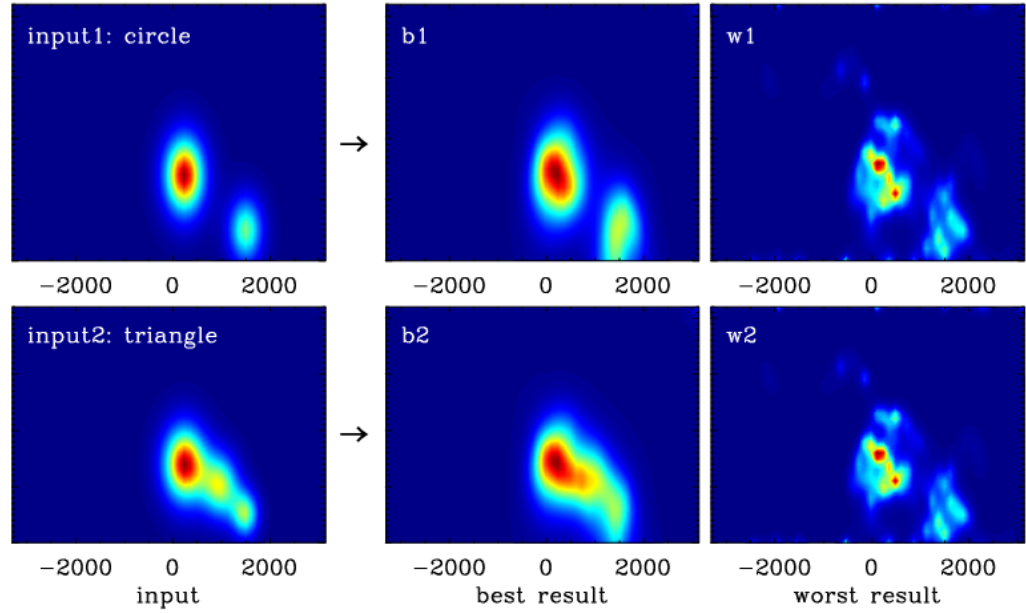


Monte Carlo simulation

Give a lower limit of the MEM fitting



An example of the
Monte-Carlo simulation



Object	Error of Recovery
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Mrk 335	2.23%
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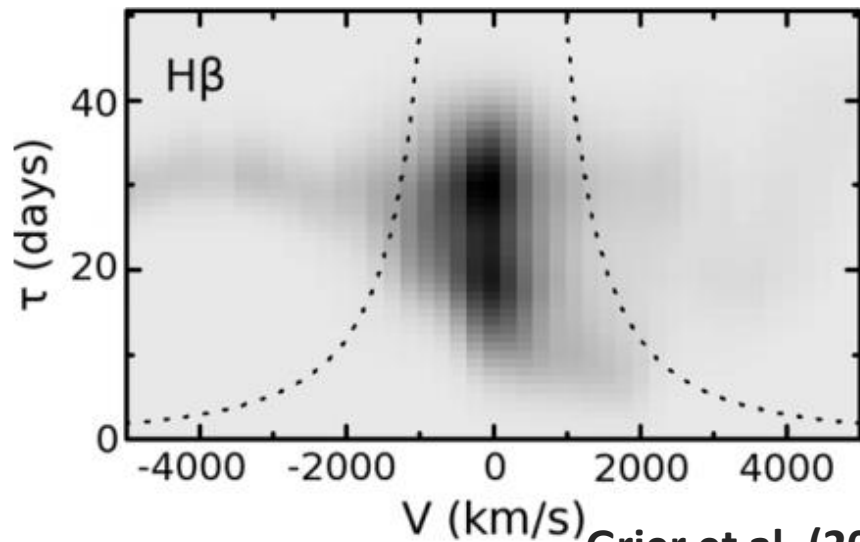
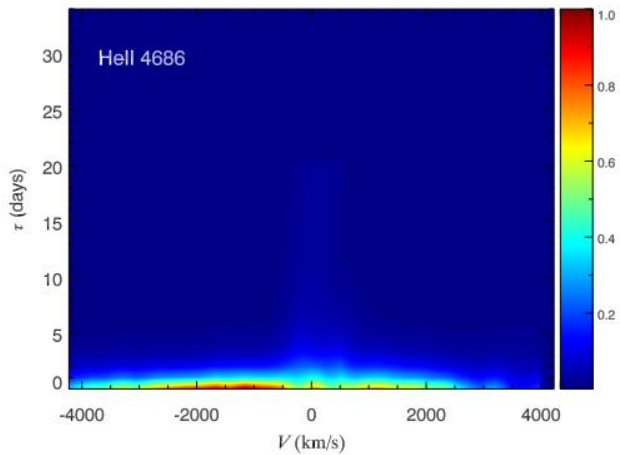
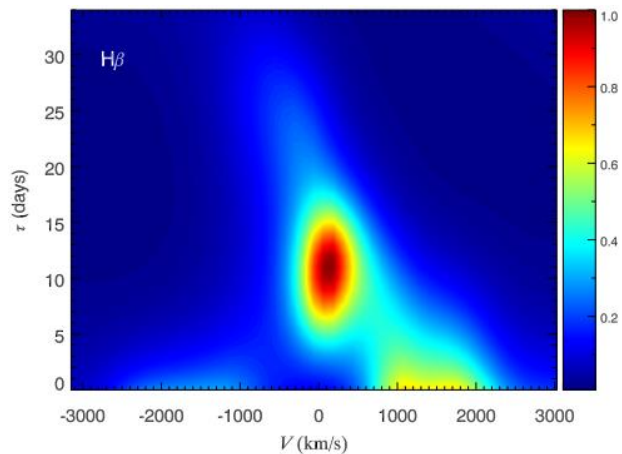
Mrk 142	2.67%
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Mrk 1044	4.07%
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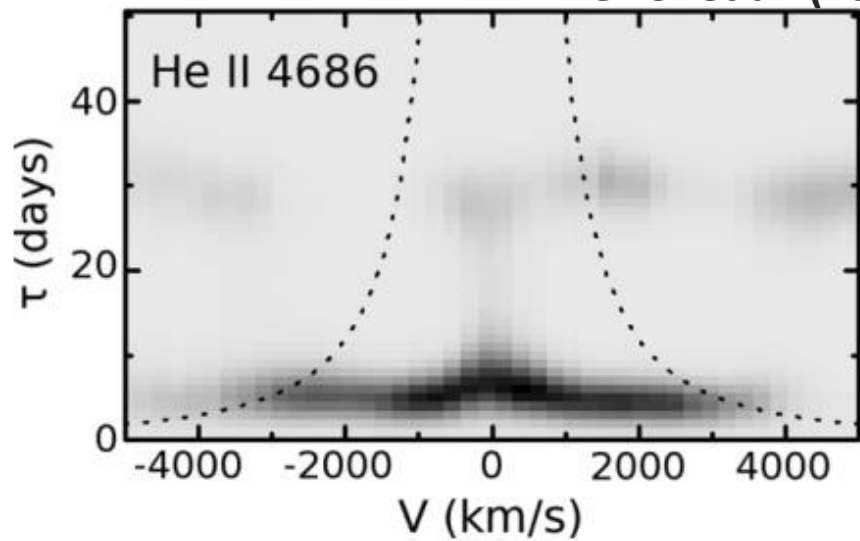
IRAS 04416+1215	2.54%
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IRAS F12397+3333	5.28%
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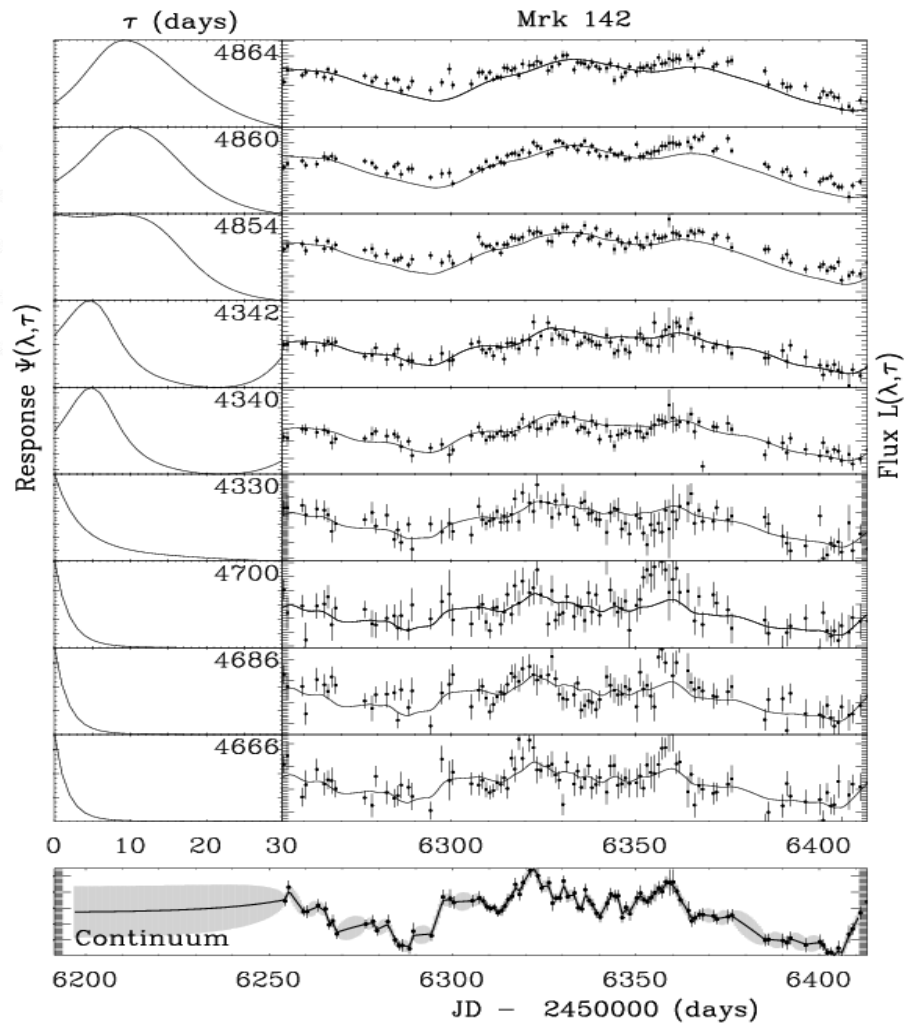
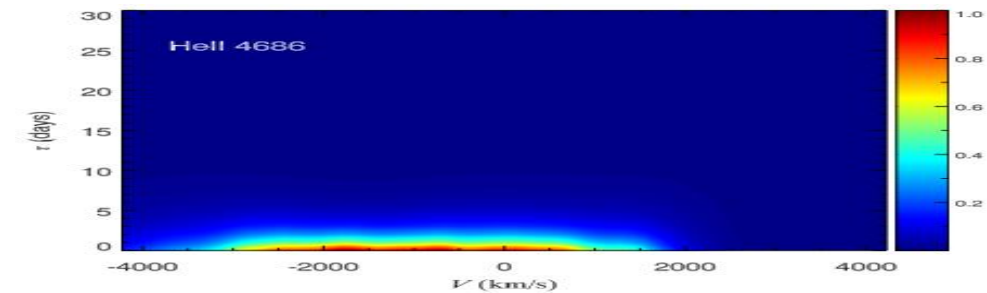
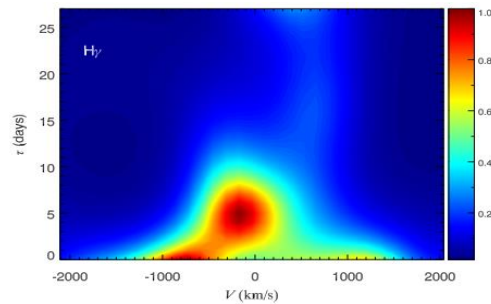
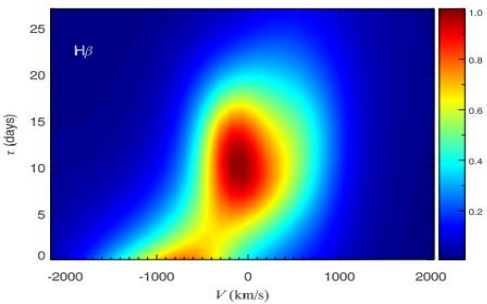
Mrk 335



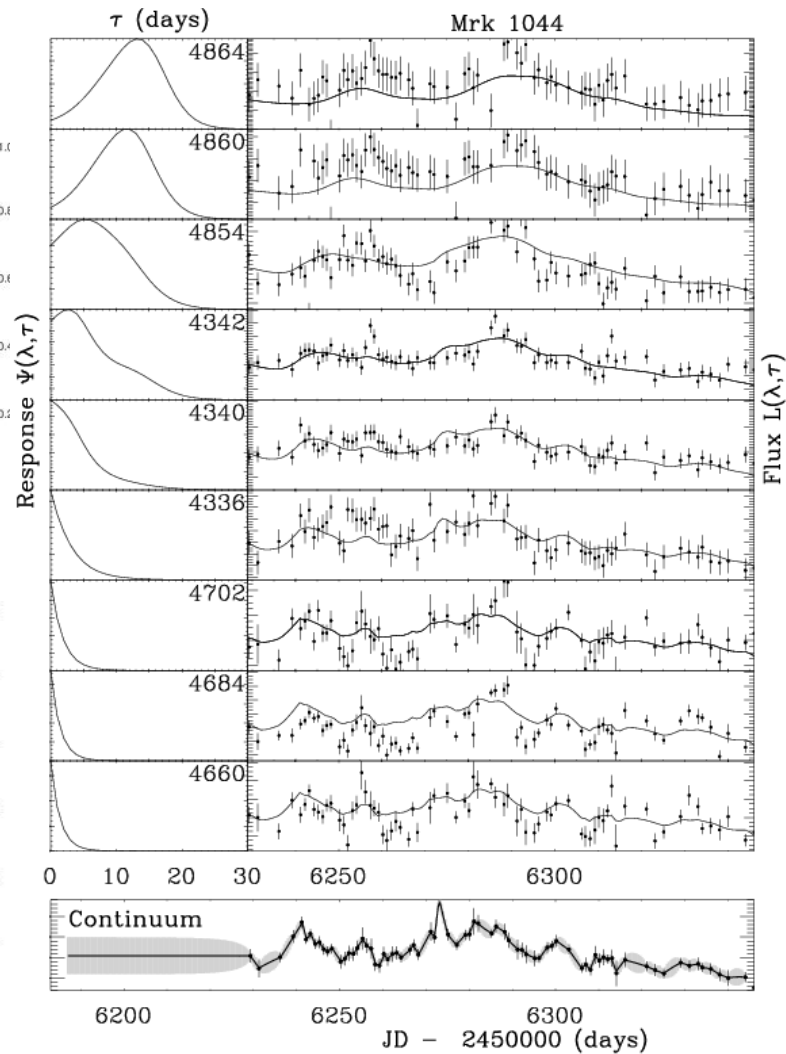
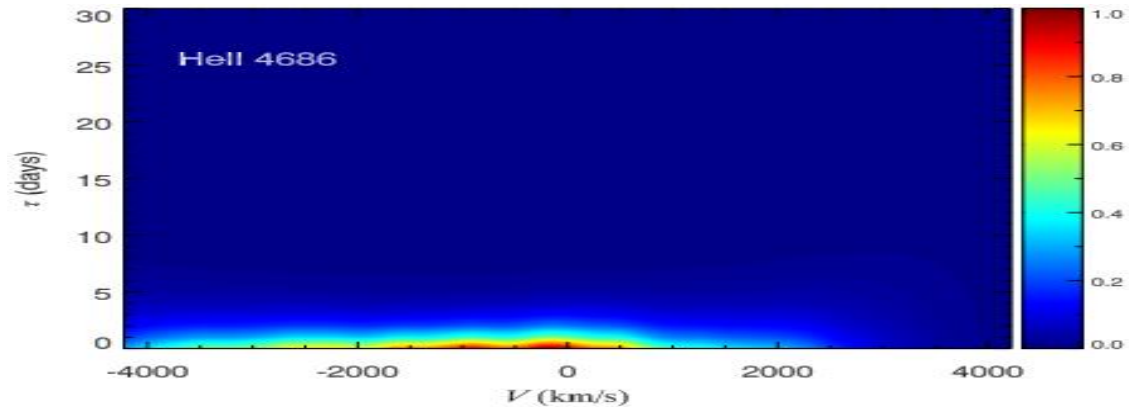
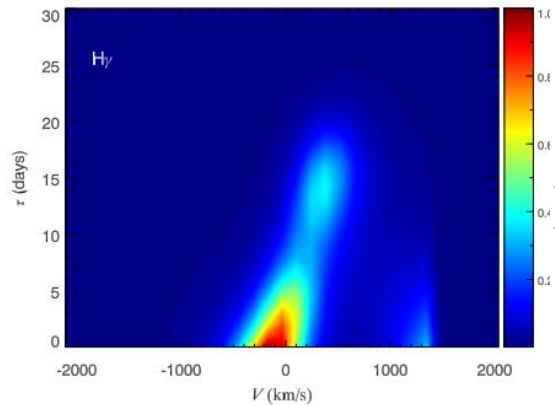
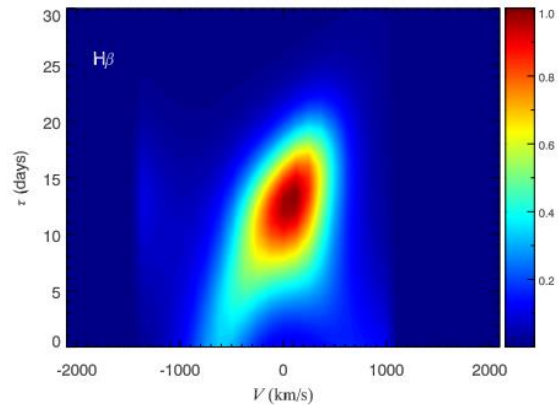
Grier et al. (2013)



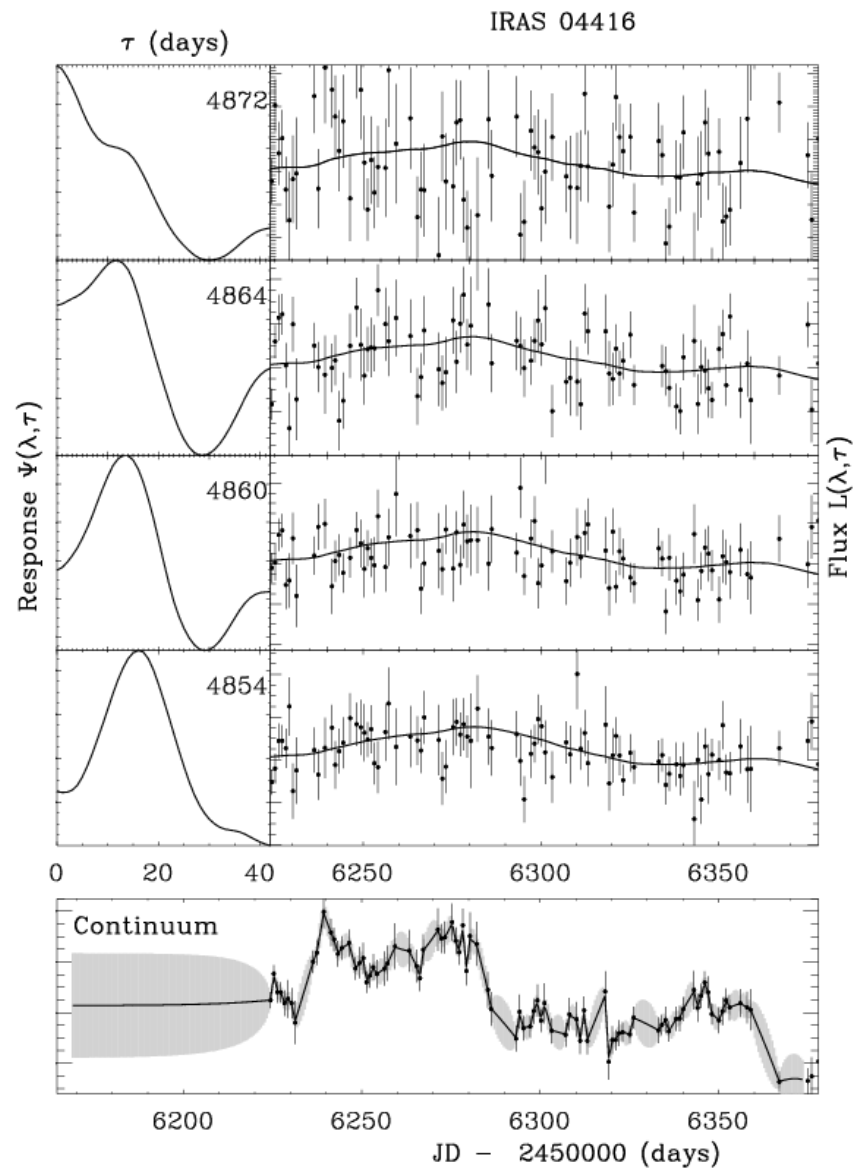
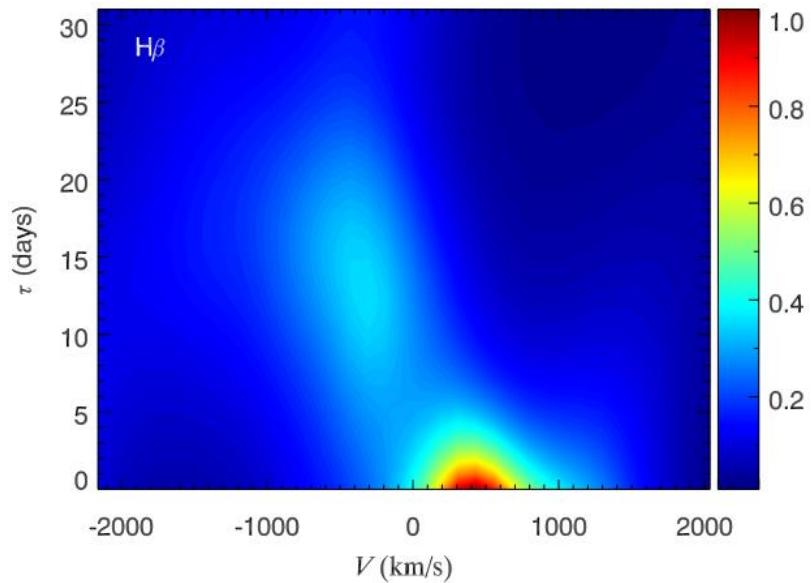
Mrk 142



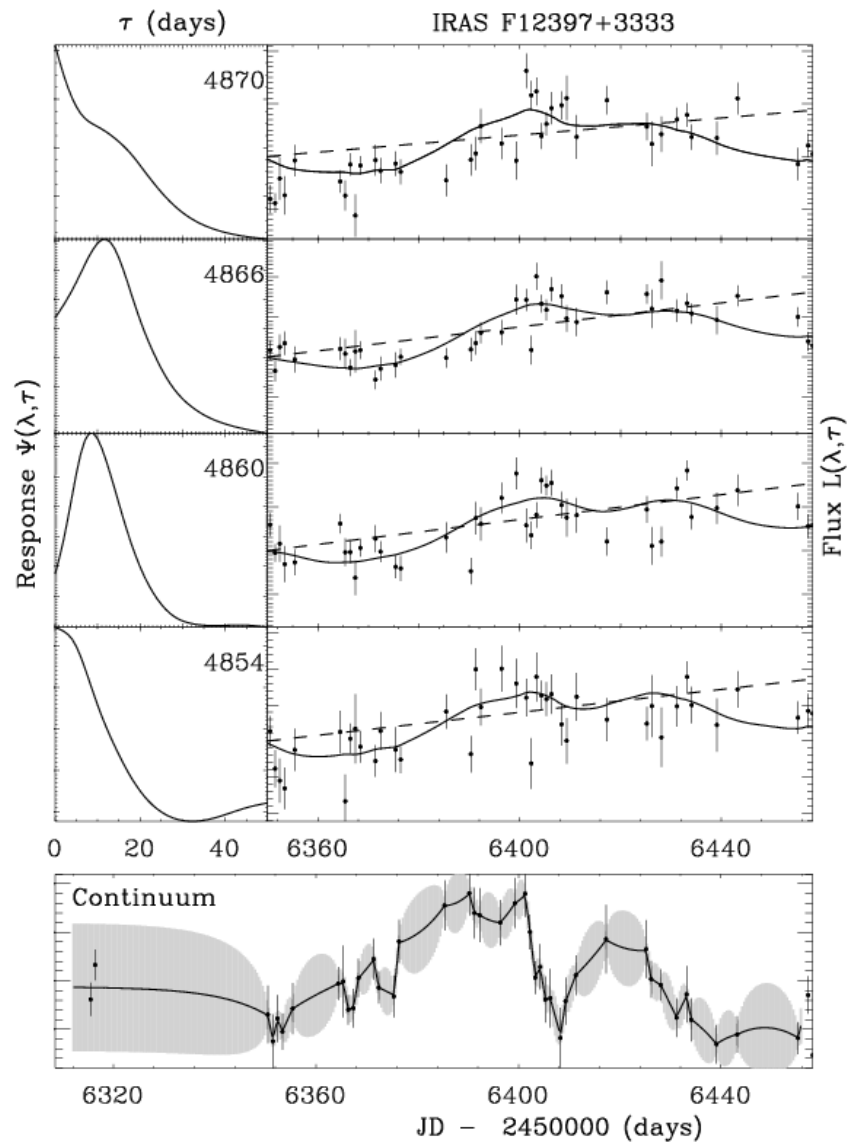
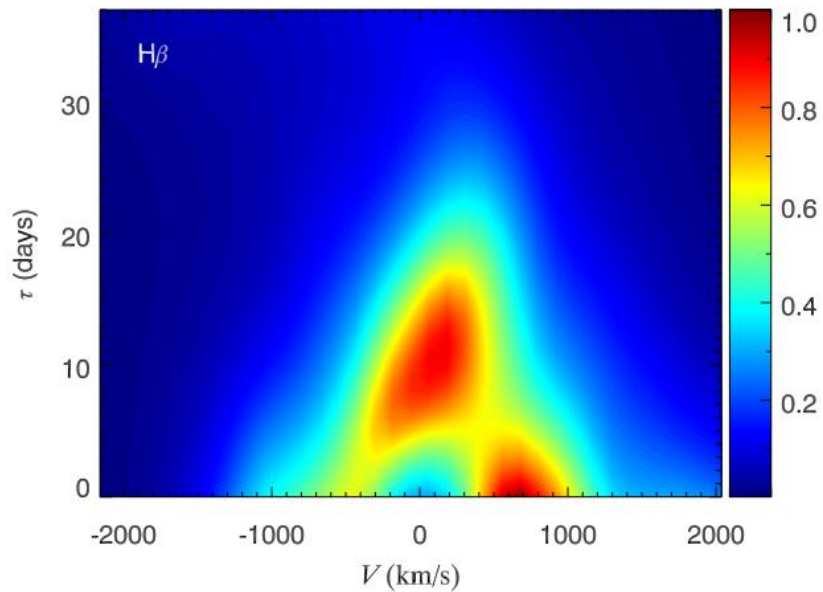
Mrk 1044



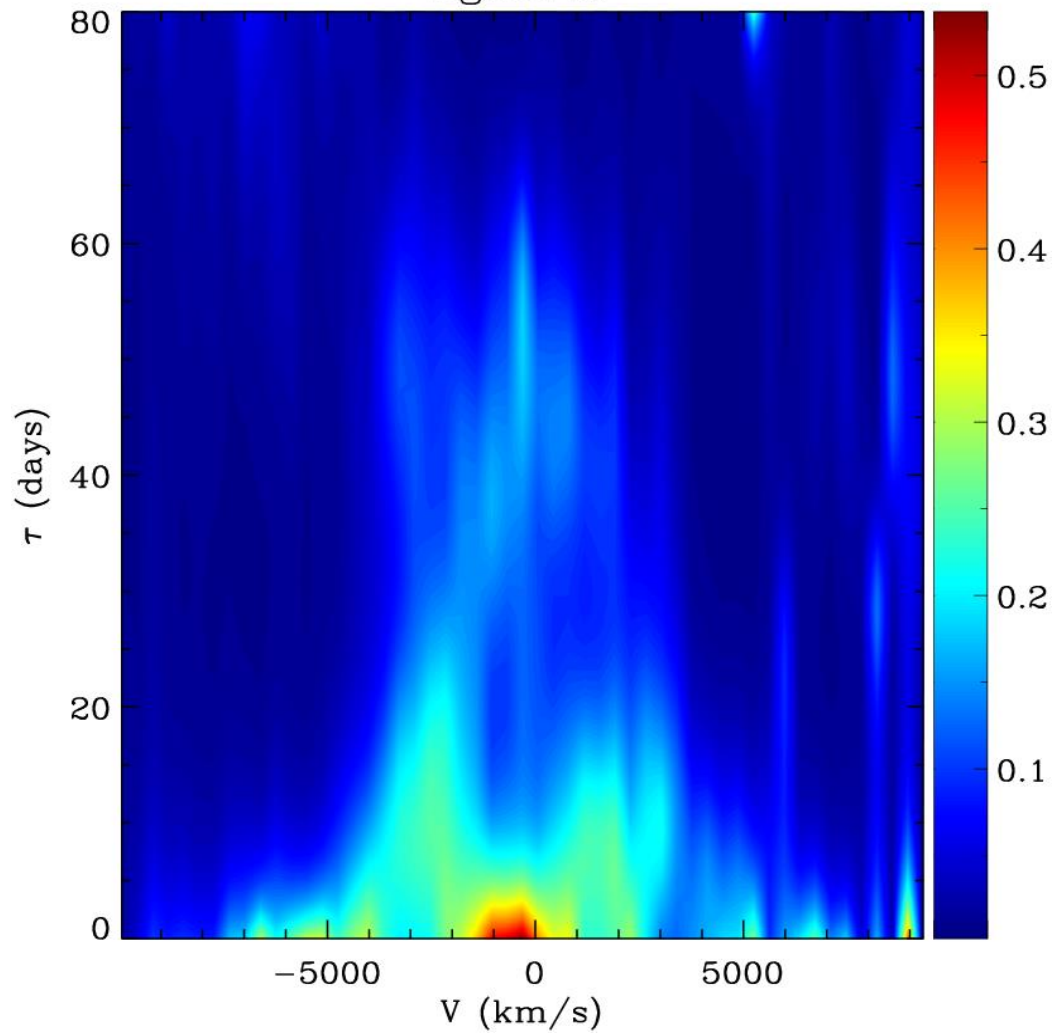
IRAS 04416+1215



IRAS F12397+3333



ngc5548



H β map for **NGC 5548**

