



TeV Gamma-Ray Observations of the Binary Pulsar PSR B1259-63/SS2883 near the July 2007 Periastron with H.E.S.S.

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bmb+f - Förderschwerpunkt
Astroteilchenphysik
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Grundlagenforschung

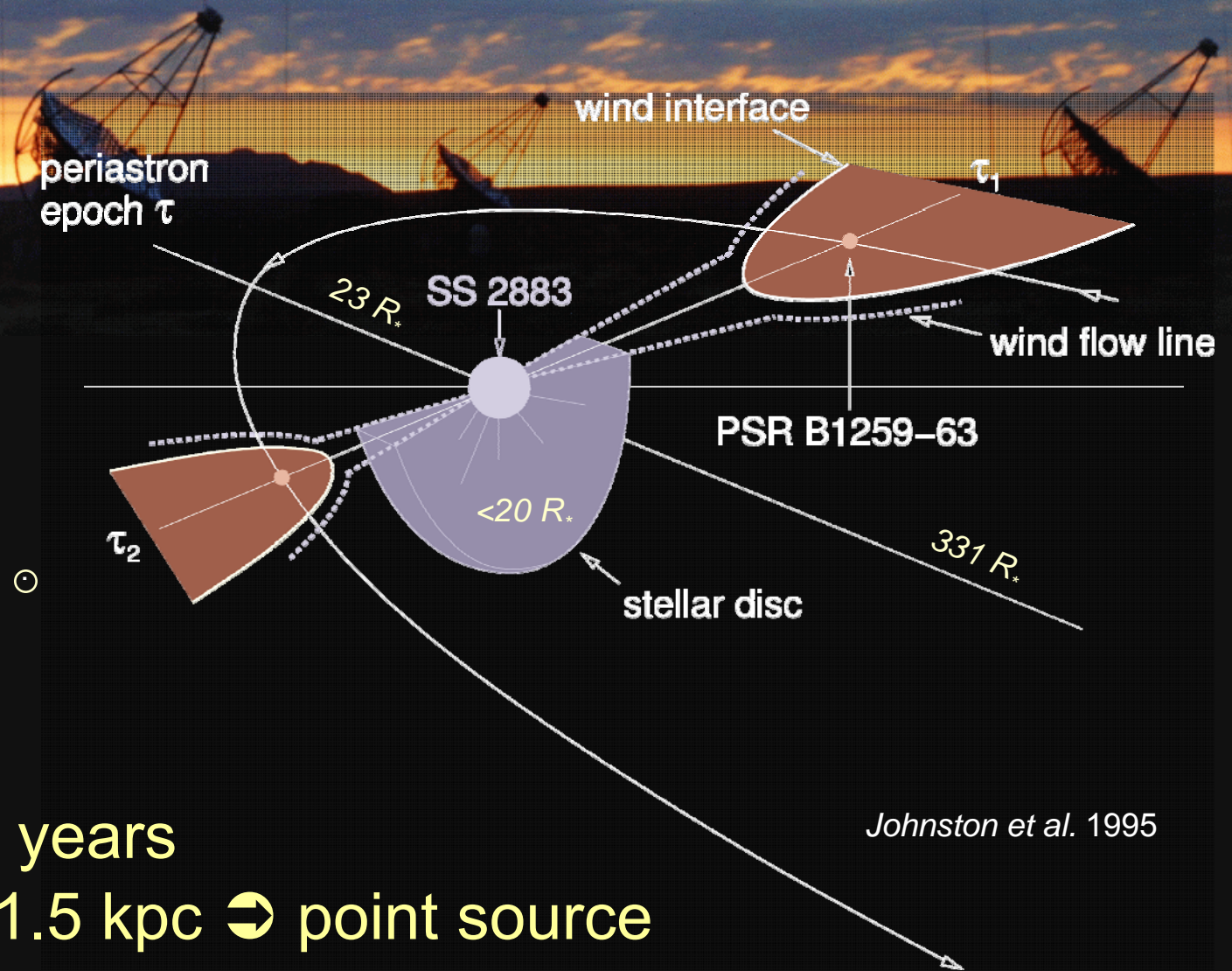


Contents

The background of the slide is a photograph of several radio telescope dishes, likely part of the Arecibo Observatory, silhouetted against a sunset sky. The sky is a mix of orange, yellow, and blue, with scattered clouds. The dishes are arranged in a line across the horizon, with their complex support structures visible against the bright light of the setting sun.

- The System PSR B1259-63/SS2883
- 2004 Data
- MWL Data
- 2007 Data (Preliminary)

The System PSR B1259-63/SS2883



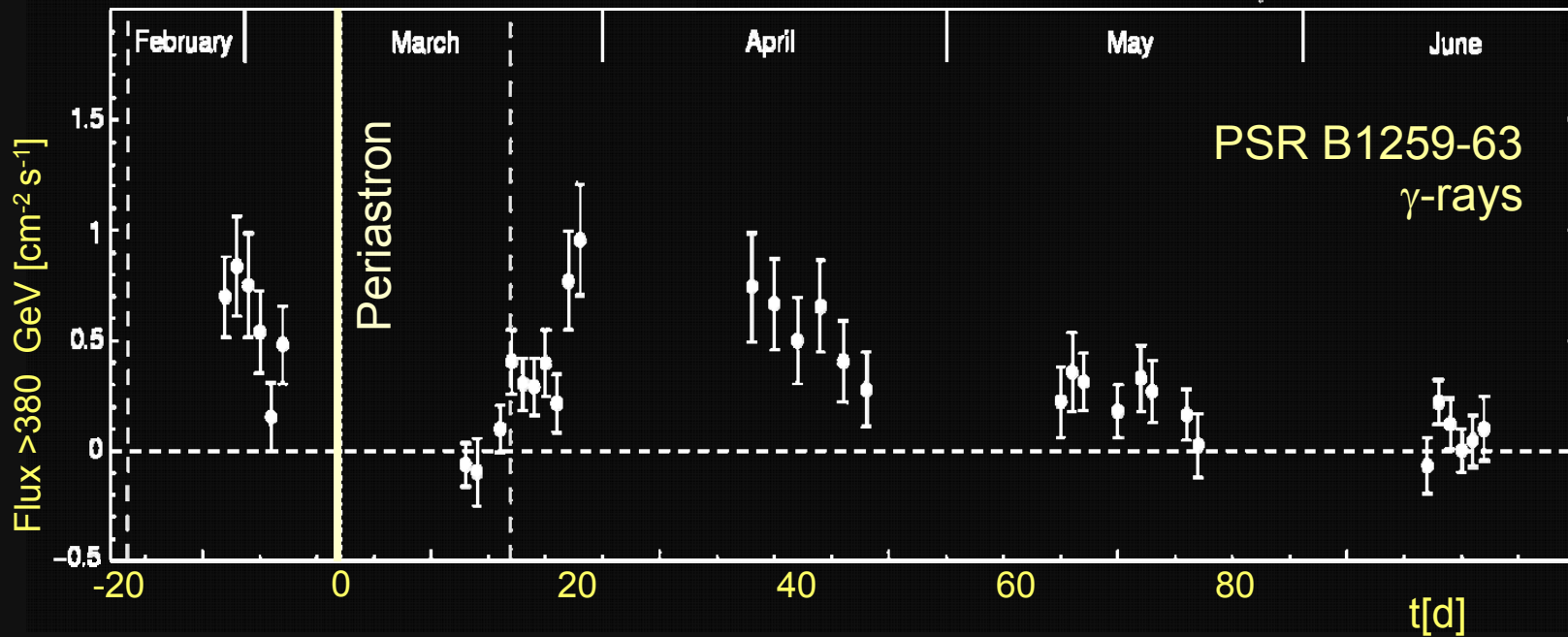
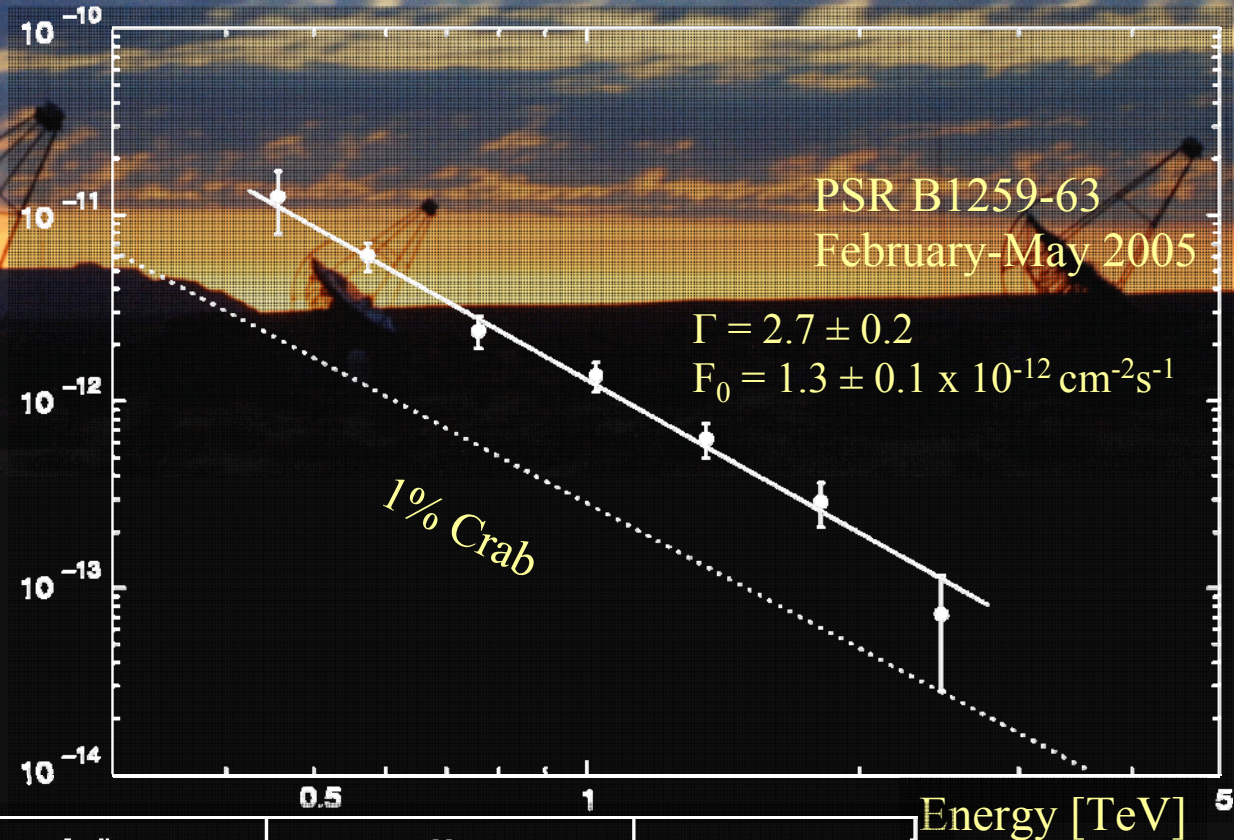
Orbit

- ▶ **Period** 3.4 years
- ▶ **Distance** 1.5 kpc \Rightarrow point source
- ▶ **Next to last periastron** 7th of March 2004
- ▶ **Last periastron** 27th of July 2007

Johnston et al. 1995

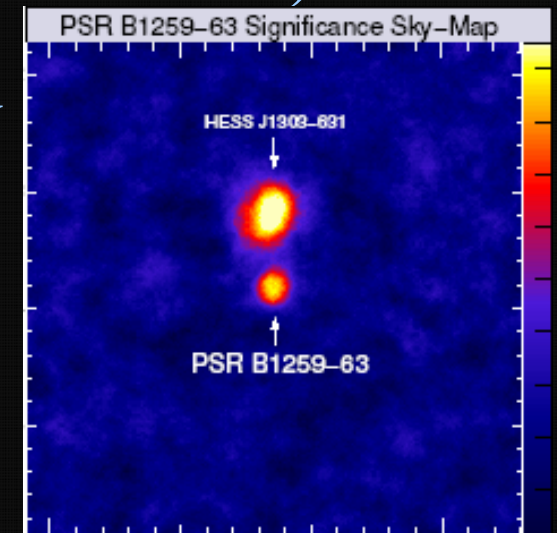
2004 Data

dN/dE [TeV⁻¹ cm⁻² s⁻¹]



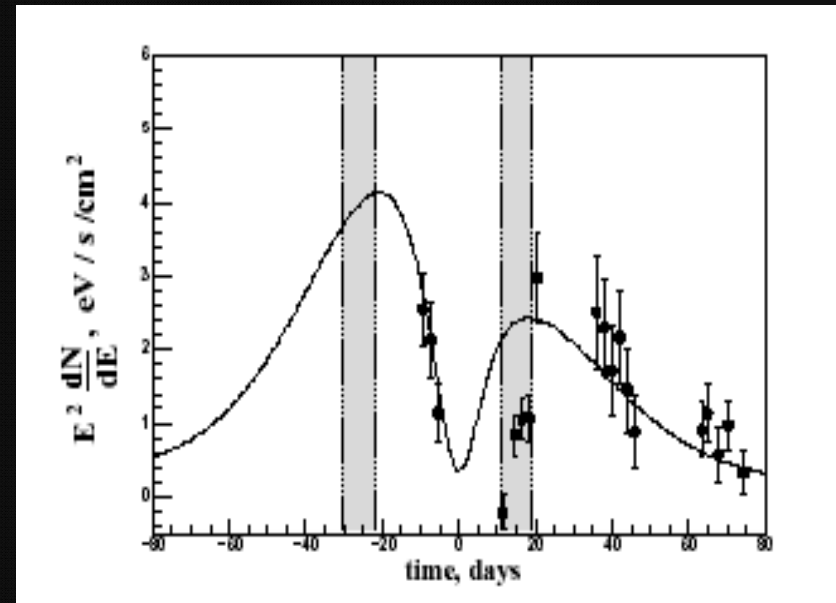
Results/Conclusions from 2004

- PSR B1259-63 first variable galactic γ -TeV source
- First detection of two sources (HESS J1303-631) in one FoV in history of TeV γ -Ray astronomy
- Unique laboratory for studying pulsar wind interactions
- γ -Ray genesis: leptonic scenario (IC) supported by spectral features



Reobservation in 2007

- Completion of lightcurve
- Expected asymmetries and other features crucial for model discrimination
- MWL picture also not complete
- Cooperation with SUZAKU, joint observations during July

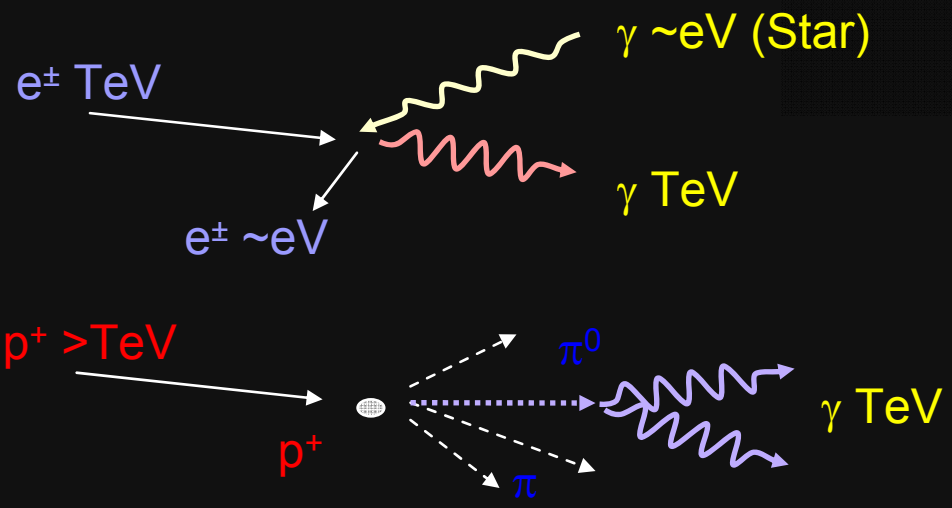
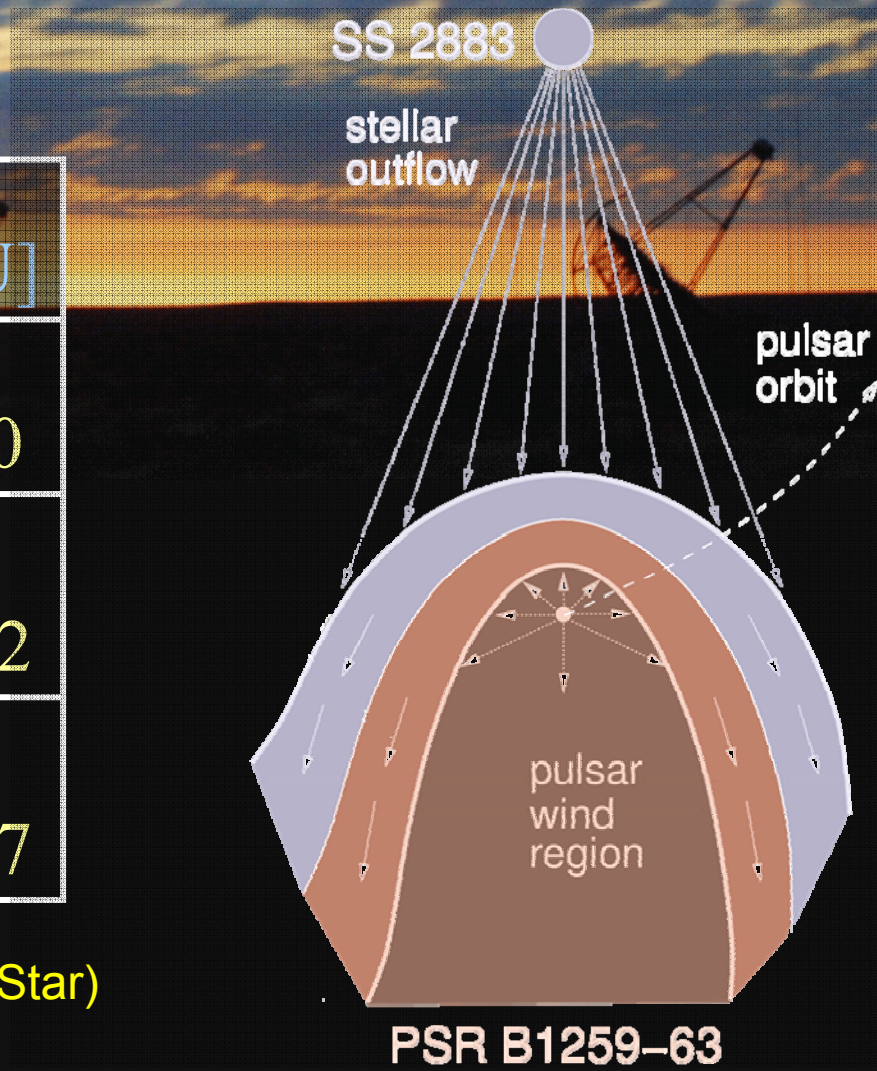


Khangulyan et al.

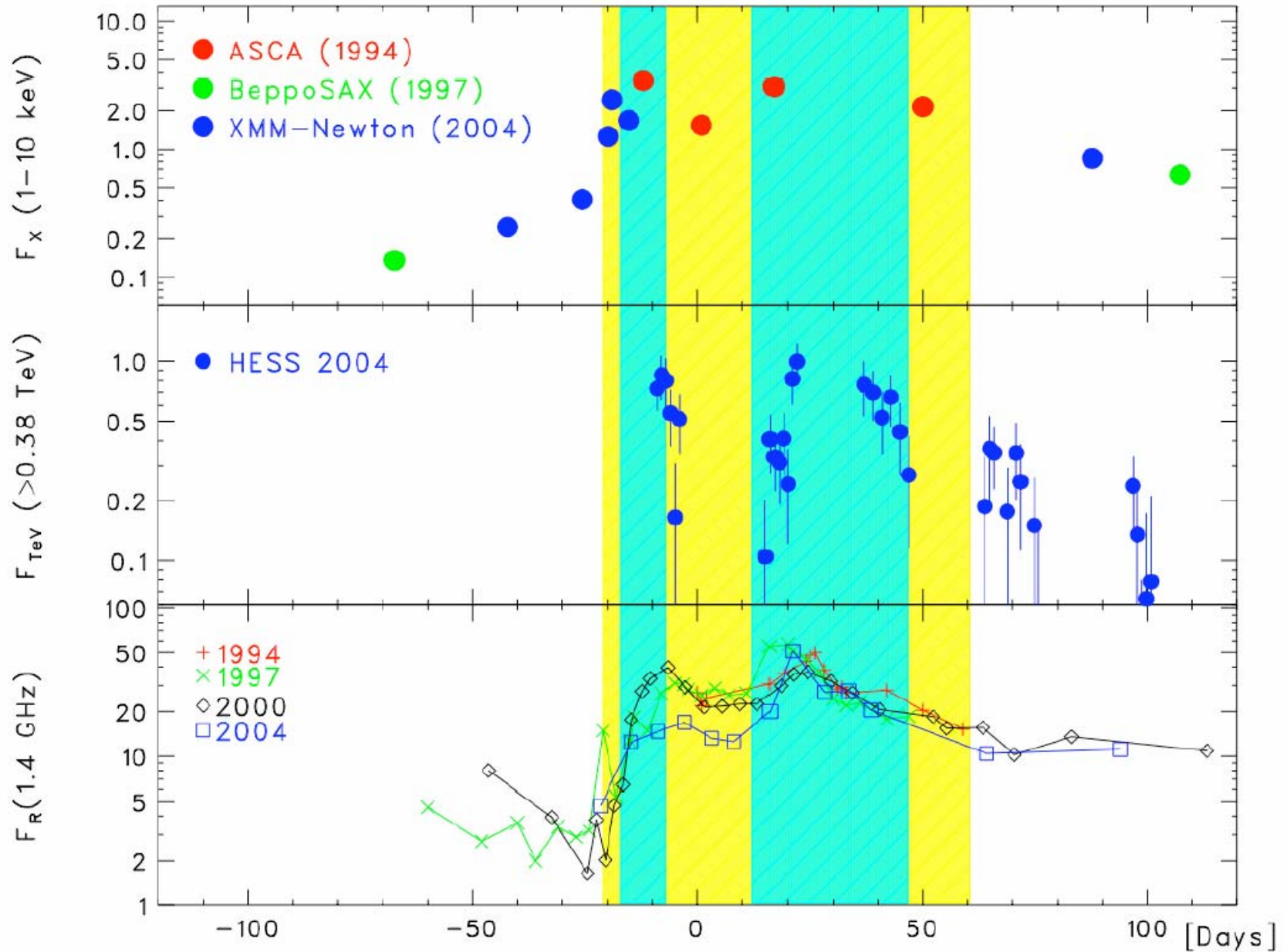
(first disc passage) and August (post periastron)

TeV γ -Ray Binaries

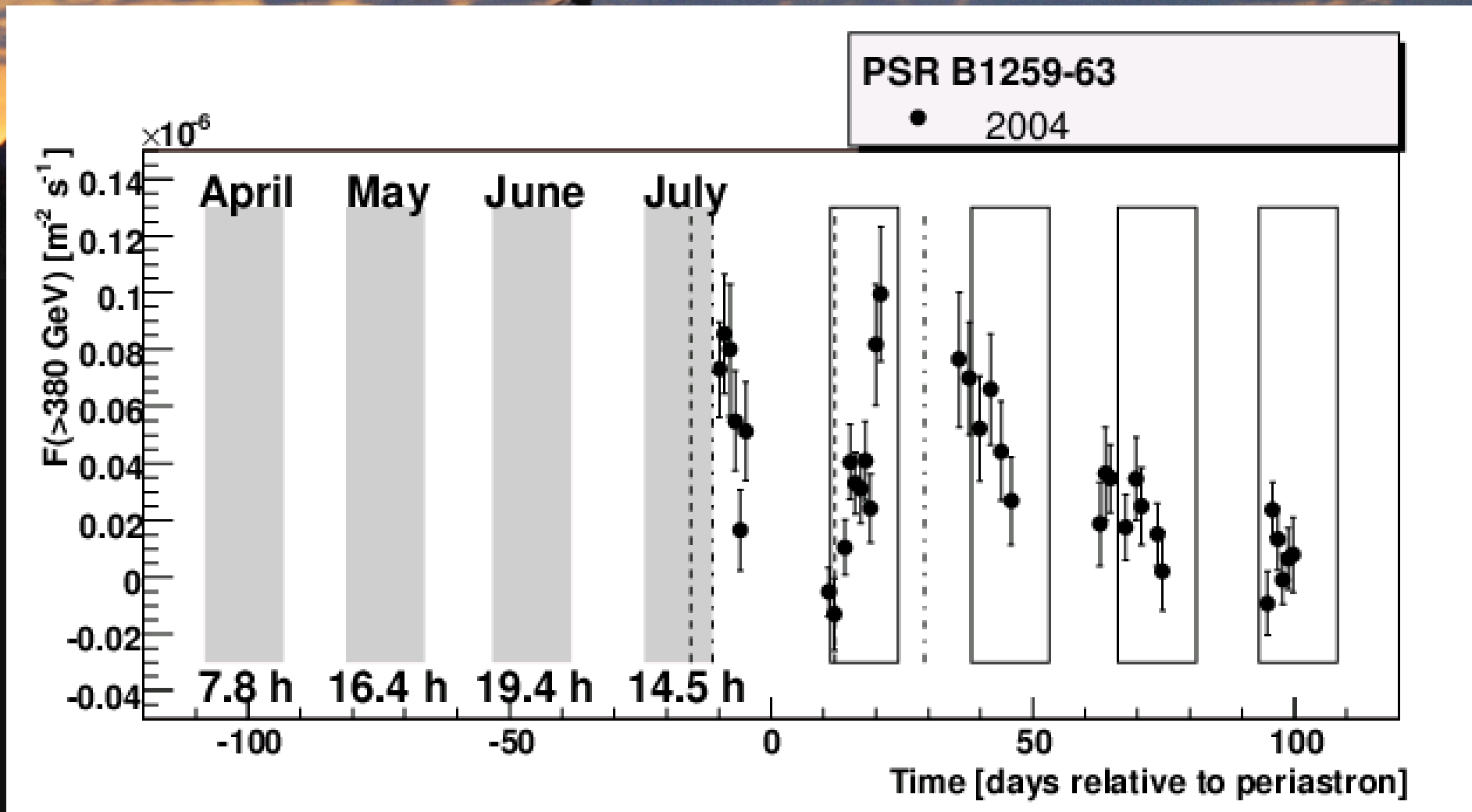
	P_{Orb} [d]	e	d_s [AU]
PSR B1259-63	1237	0.87	0.7-10
LS 5039	3.9	0.35	0.1-0.2
LSI +61°303	26.5	0.72	0.1-0.7



MWL Data



2007 Campaign



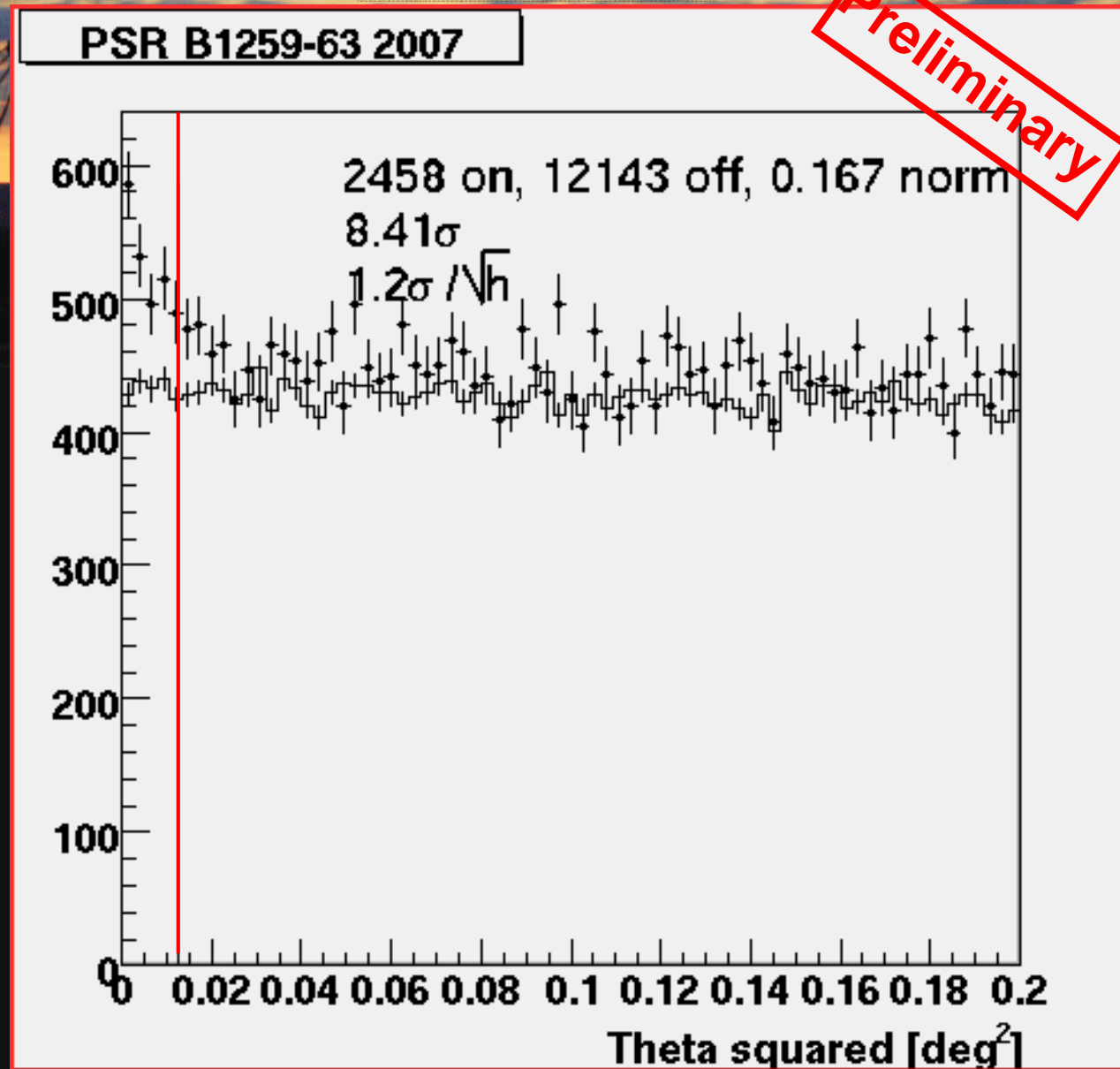
~ 60 h of intended data taking from April to July
2007

Results April – July 2007

SIGNAL

Preliminary

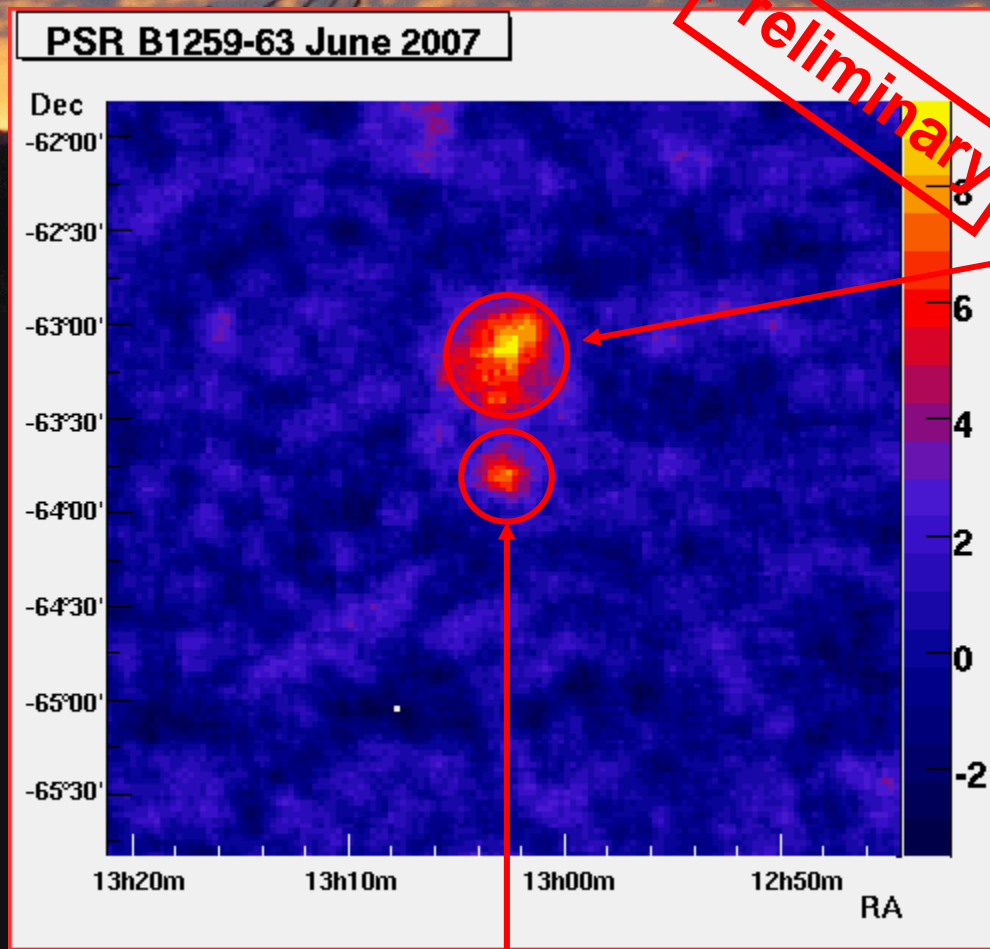
Month	Livetime [h]*
April	5.3
May	14.6
June	15.0
July	14.4
Total	49.4



425 photons, $>8 \sigma$

* Livetime in 2004 ~45h

Skymaps



Preliminary

HESS J1303-631

PSR B1259-63

2007 May - June

Summary



- PSR B1259-63 re-detected ($>8 \sigma$) in TeV γ -Rays
- Time averaged spectrum consistent with 2004
- New data for the completion of pre-periastron part of lightcurve
- Important input for system modelling