



Where are the solar magnetic poles?

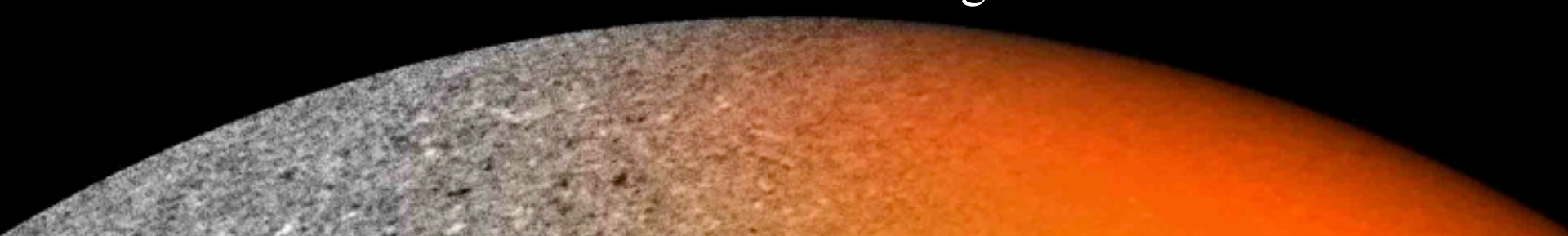
Adur Pastor Yabar (apastor@iac.es)

María Jesús Martínez González

Manuel Collados Vera

Instituto de Astrofísica de Canarias

Universidad de La Laguna



OUTLINE

- Introduction
- Data & procedure
- Results
- Conclusion

INTRODUCTION

January 16-20, 2017

4th SOLARNET meeting; A. Pastor Yabar

Introduction

- Babcock & Babcock 1955:
 - They Discovered the Presence of a Dominant Polarity at the Polar Caps

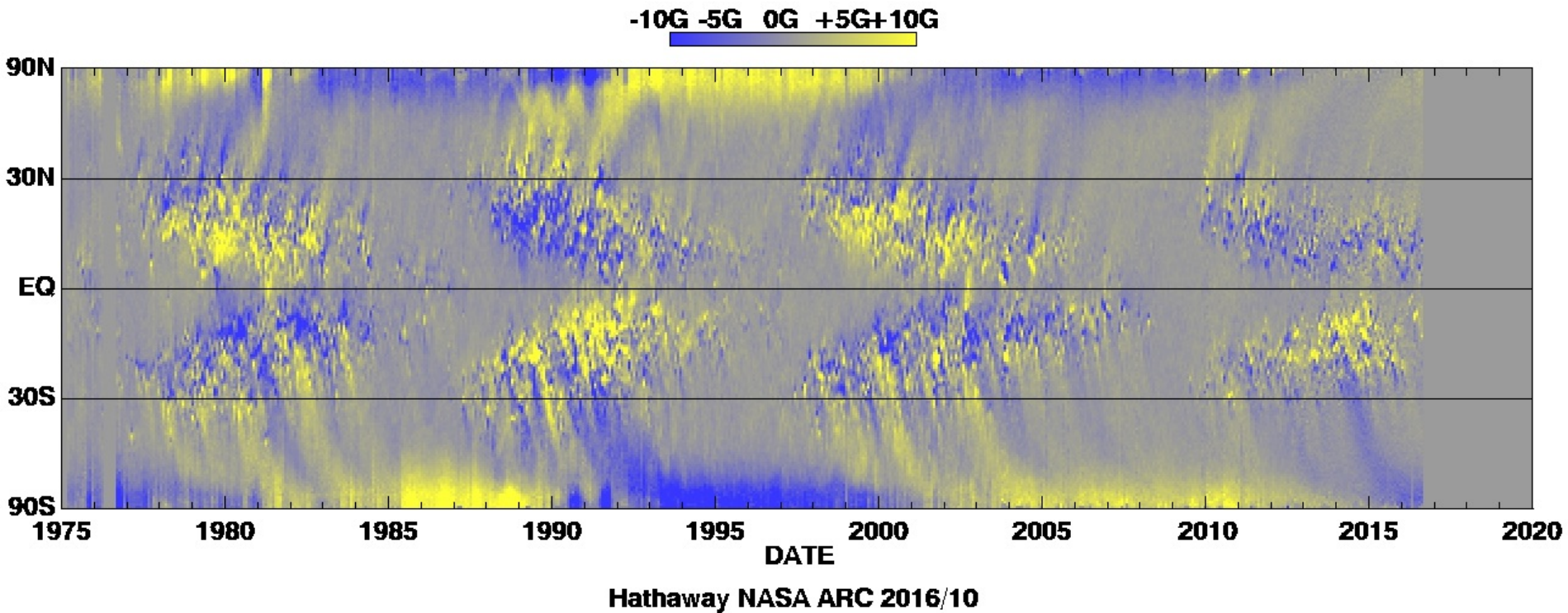
Introduction

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 - They Discovered the Presence of a Dominant Polarity at the Polar Caps
 - The Sign of This Magnetic Signal at Each Pole is of Opposite Polarity
- Babcock 1959:
 - The Dominant Polarity at Each Polar Region Reversed Their Polarity in a Maximum of Activity

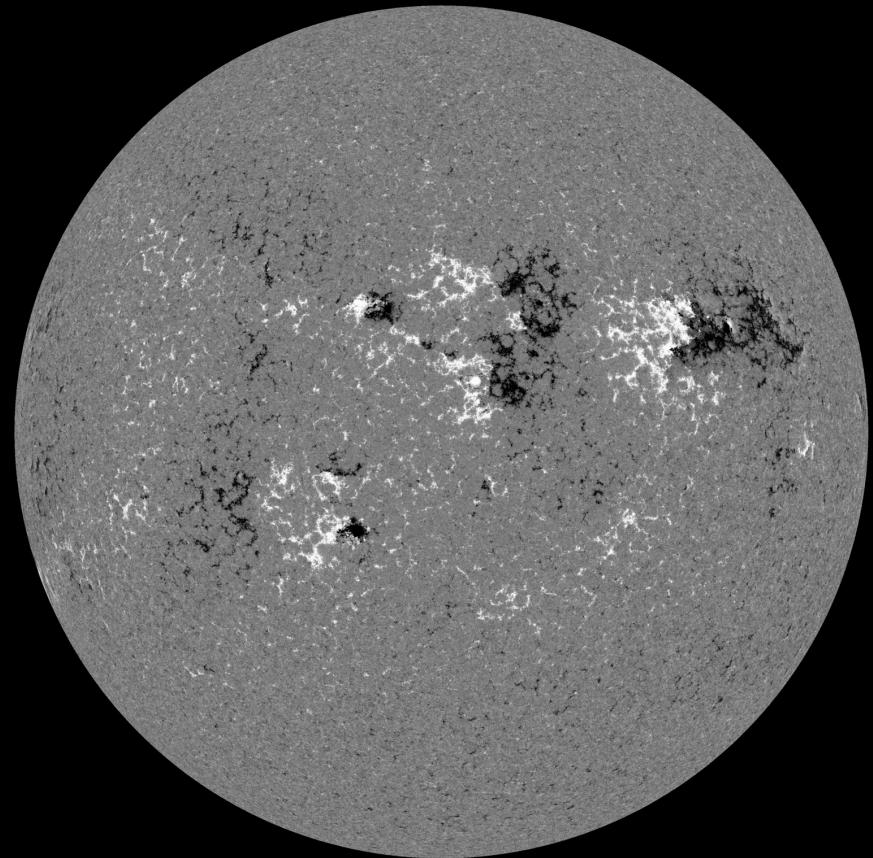
Introduction



DATA & PROCEDURE

Data & procedure

- HMI@SDO Magnetograms:
 - Data Since 2010
 - FeI 6173Å
 - Full Disk
 - Spatial Resolution 1"



SDO/HMI Quick-Look Magnetogram: 20150610_163000

Data & procedure

MOVIE 1



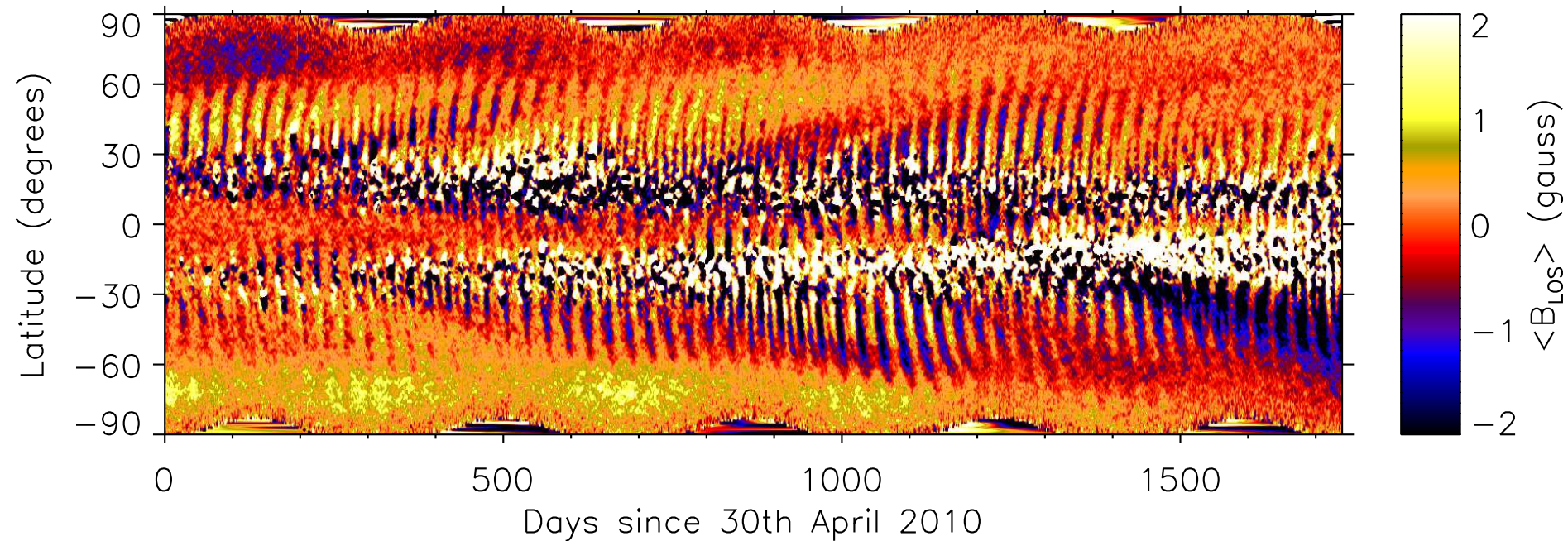
RESULTS

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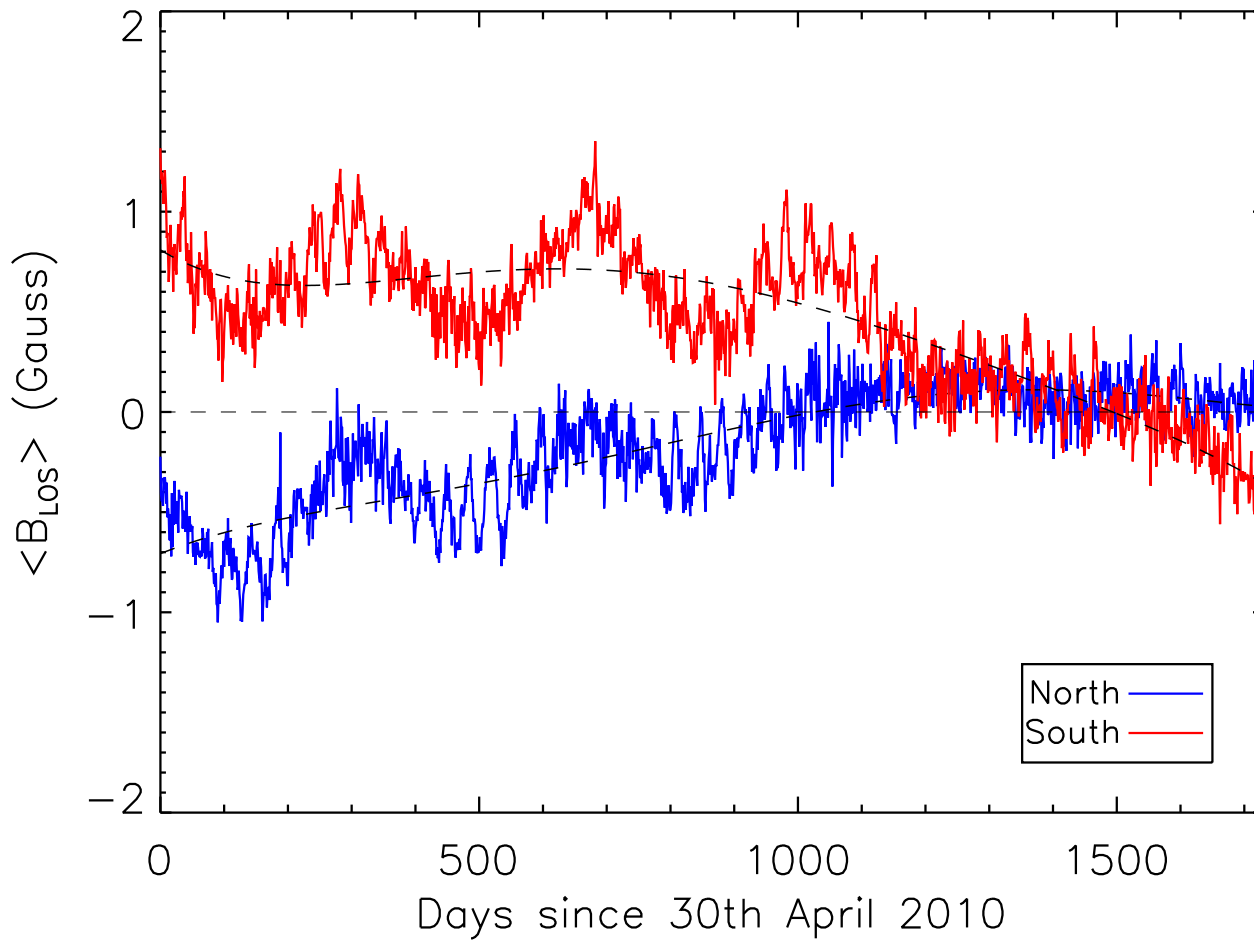
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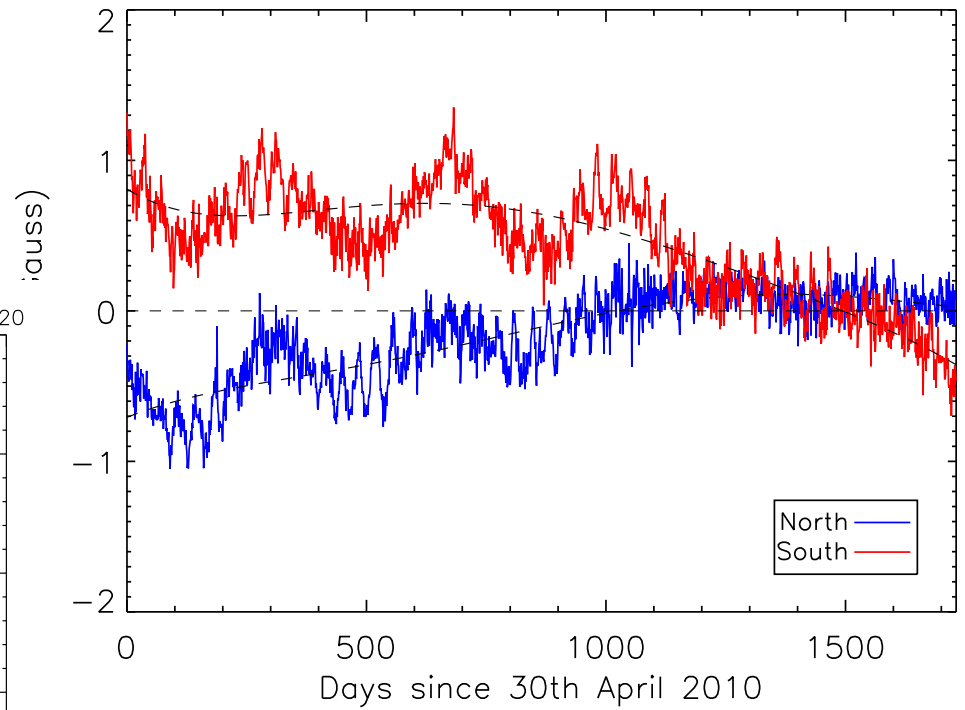
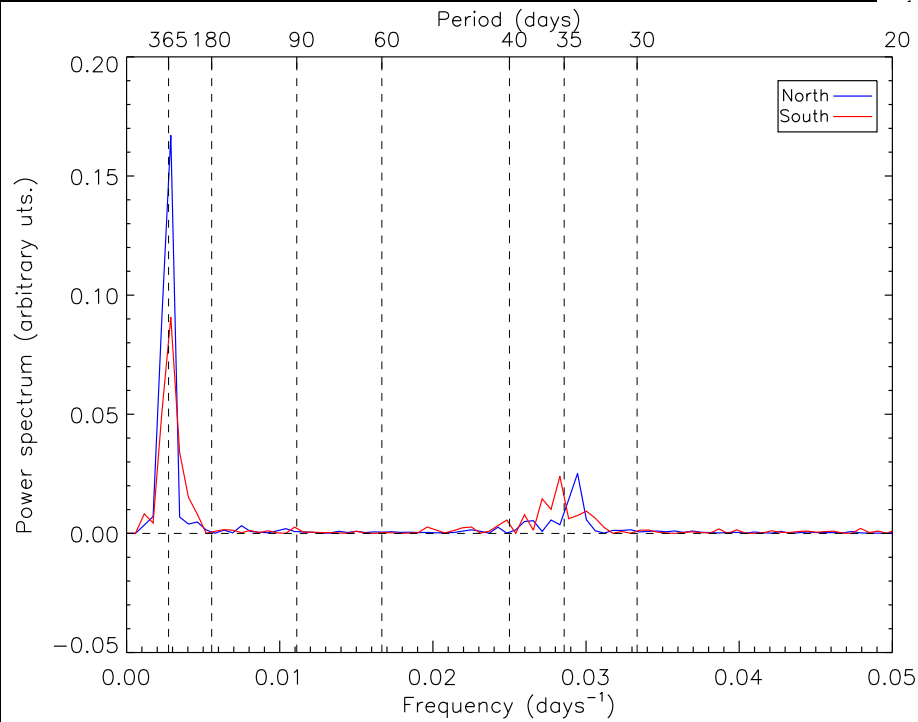
Results



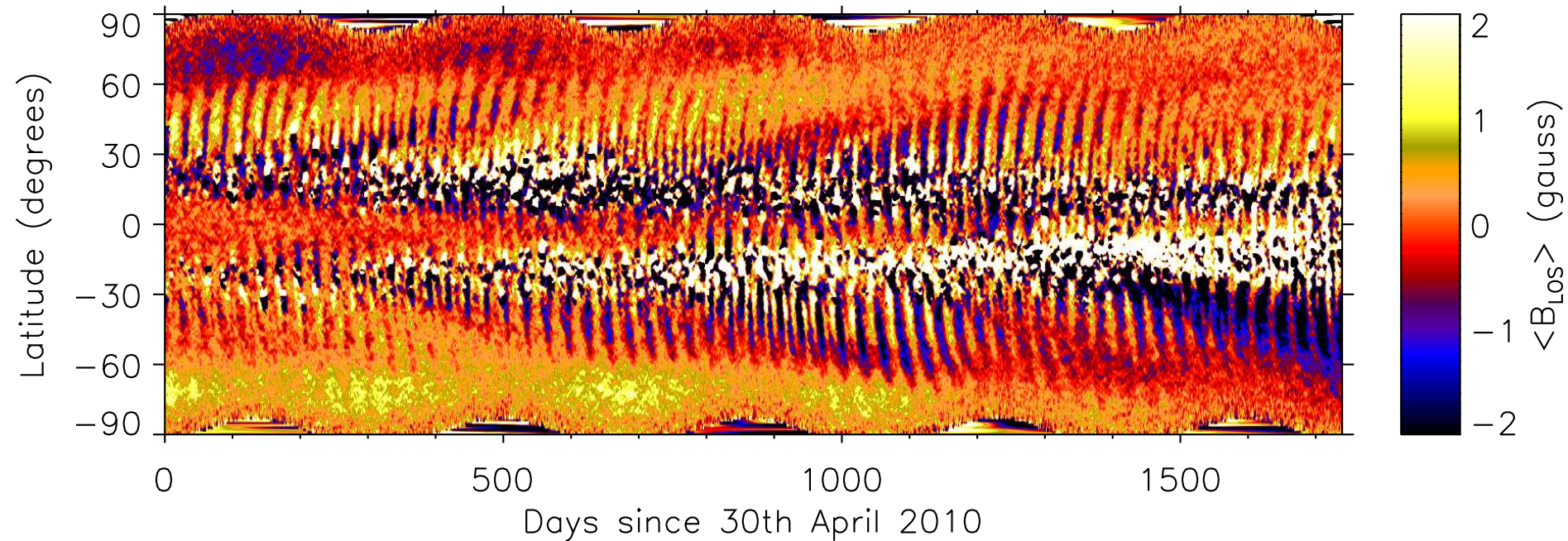
Results



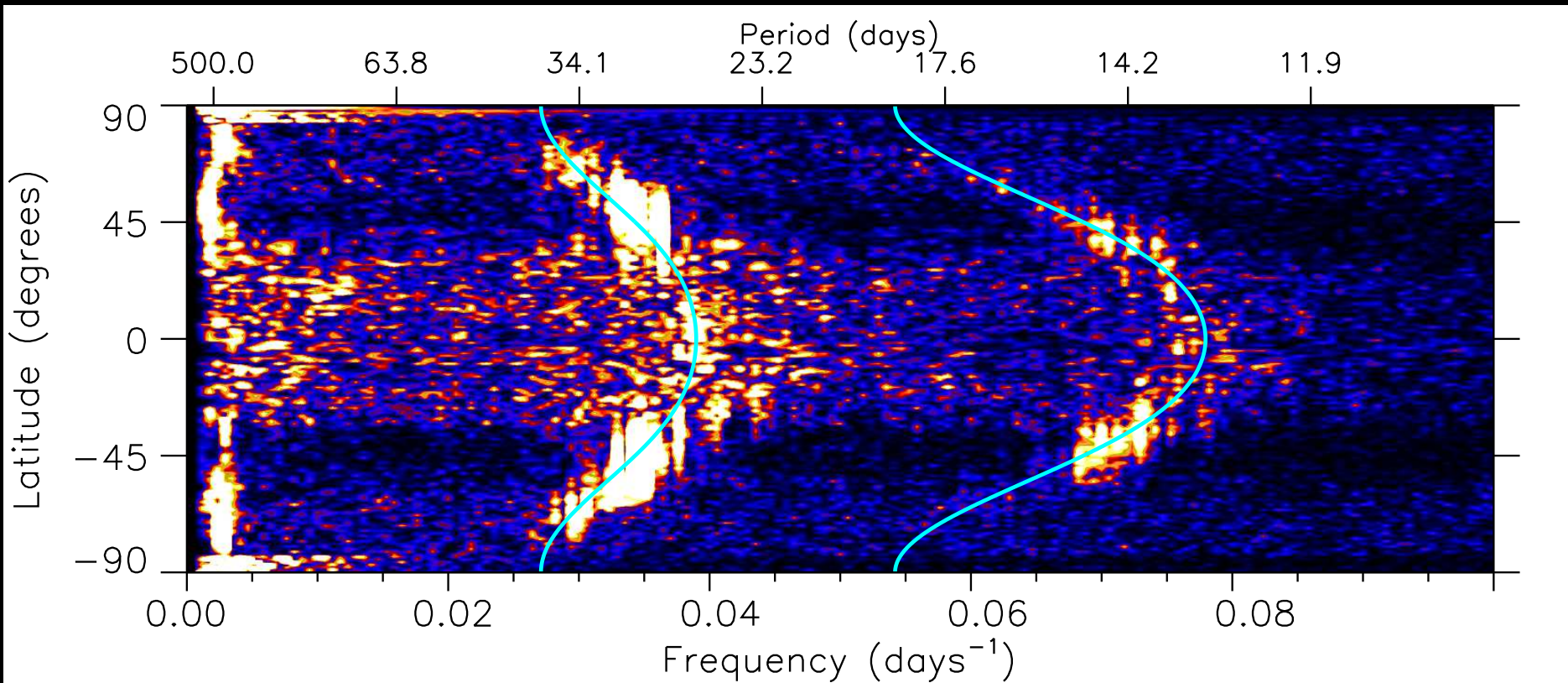
Results



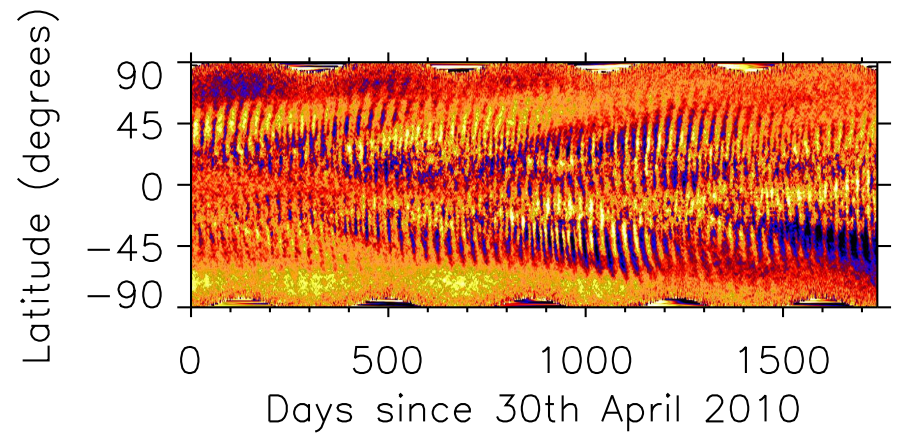
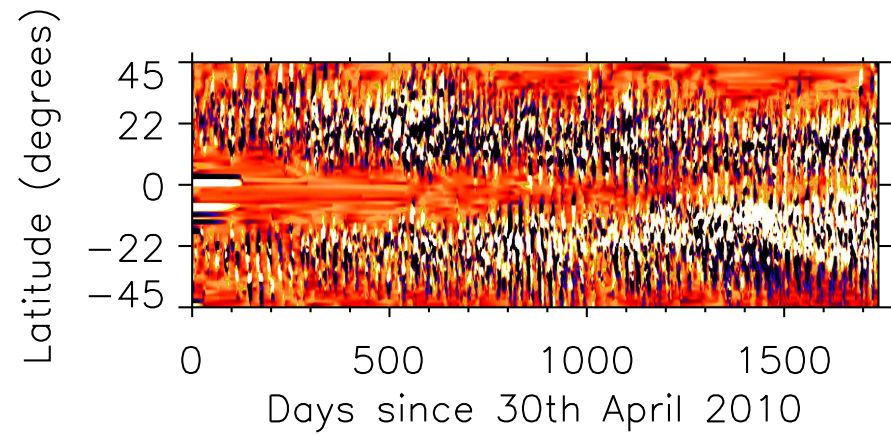
Results



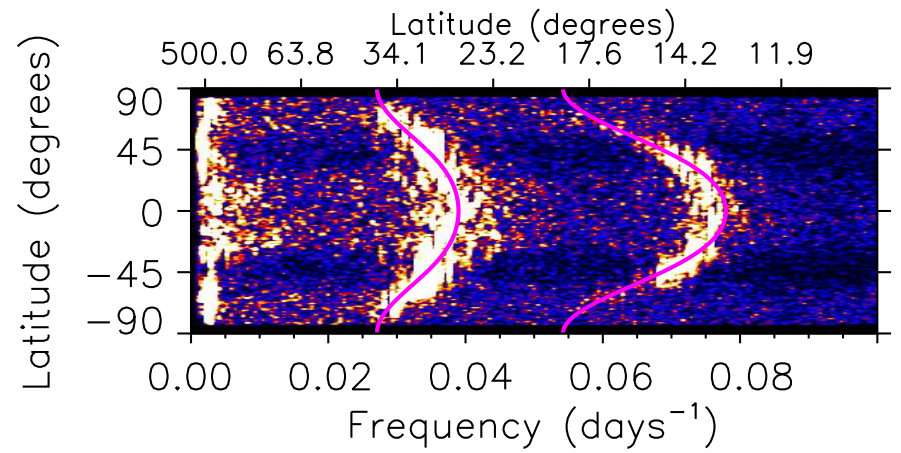
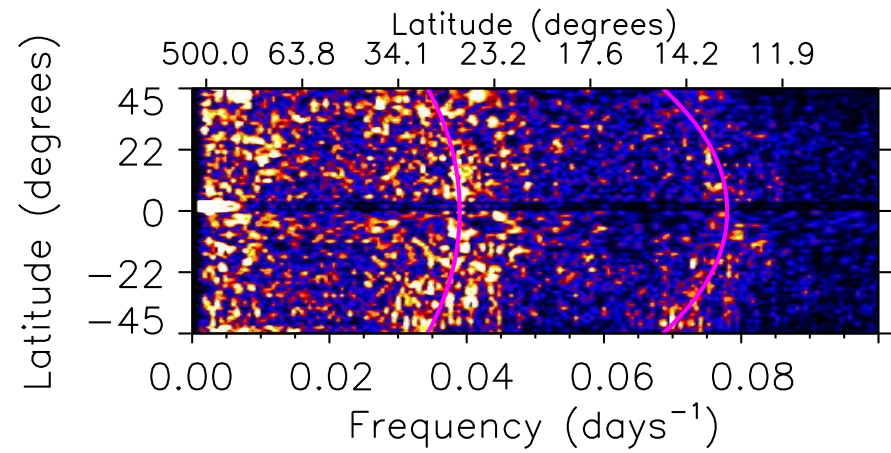
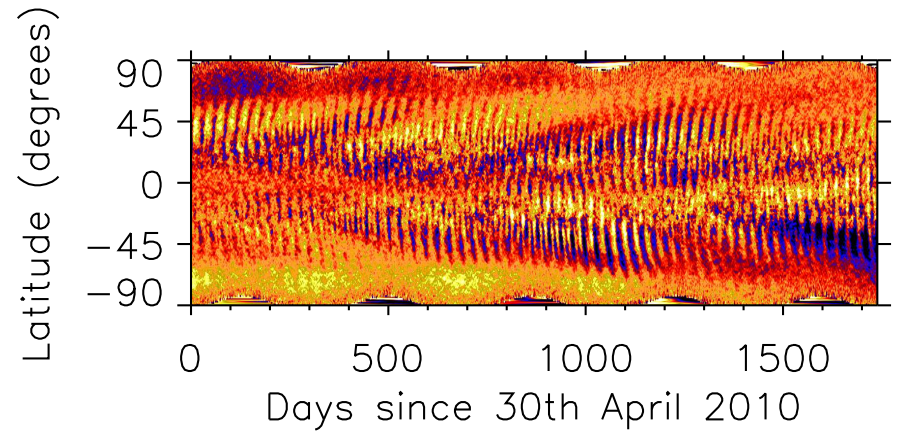
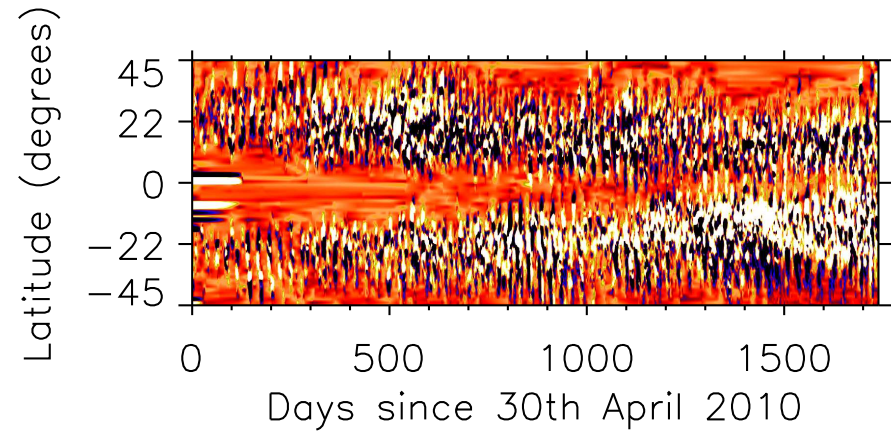
Results



Results



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Results

- Equations Of A Dipole Oblique Rotator:

$$\mathbf{B}(\mathbf{r}) = -\frac{H_d}{2} [\mathbf{e} - 3(\mathbf{e} \cdot \mathbf{r})\mathbf{r}]$$

- Take Into Account B_0
- Differential Rotation

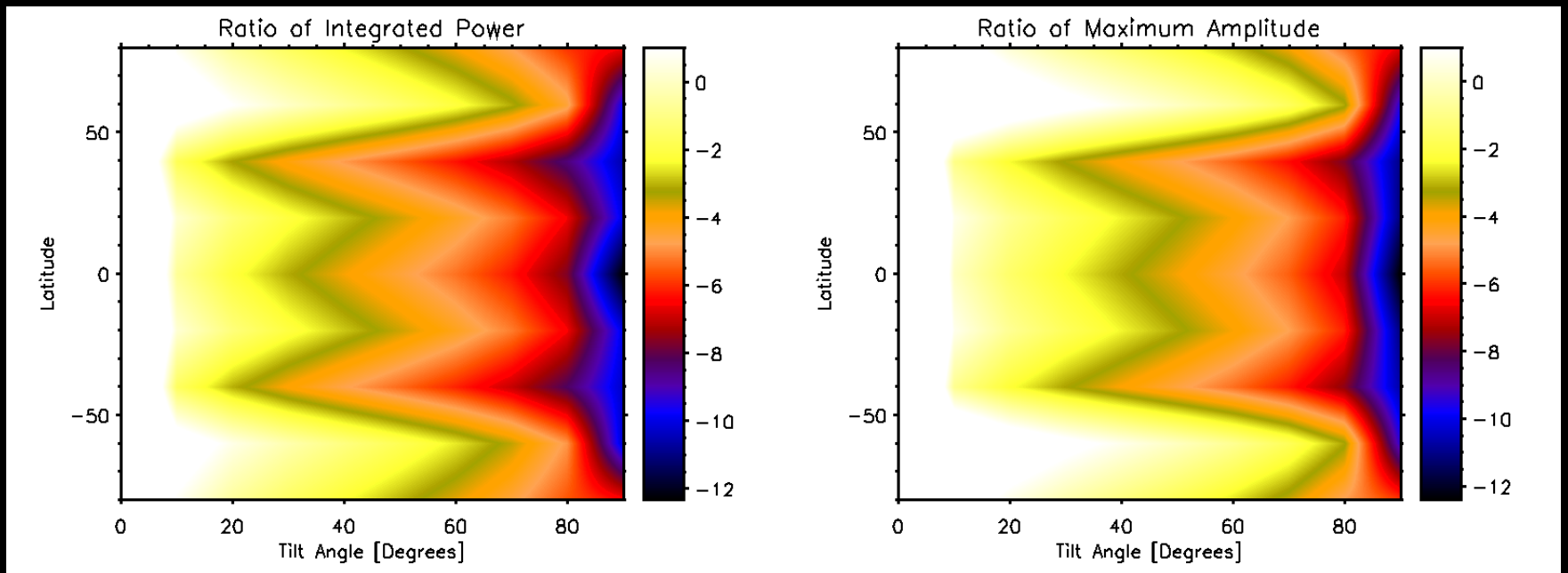
Results

MOVIE 2

Results

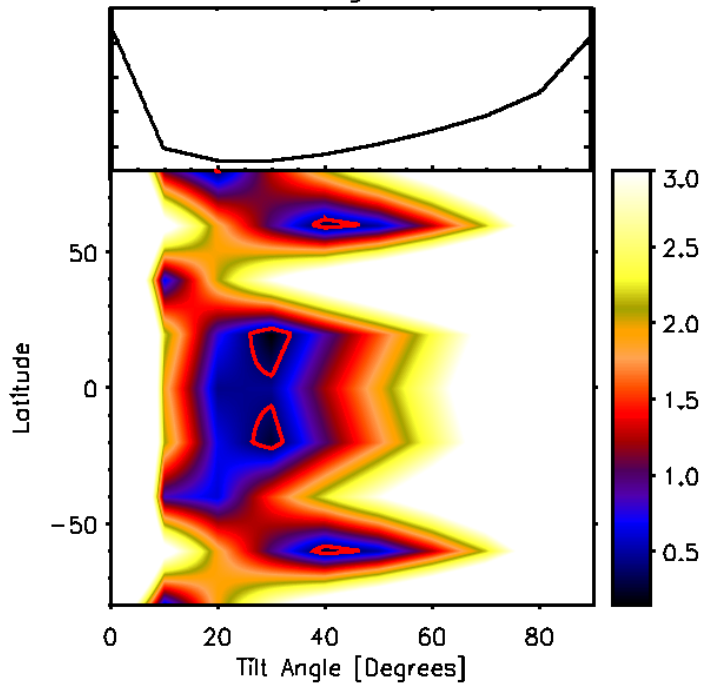
$$r = \frac{\int_{\nu_{orbit}-\Delta\nu}^{\nu_{orbit}+\Delta\nu} p(\nu) d\nu}{\int_{\nu_{rotation}-\Delta\nu}^{\nu_{rotation}+\Delta\nu} p(\nu) d\nu}$$

$$r = \frac{\max[p(\nu_{orbit} - \Delta\nu, \nu_{orbit} + \Delta\nu)]}{\max[p(\nu_{rotation} - \Delta\nu, \nu_{rotation} + \Delta\nu)]}$$

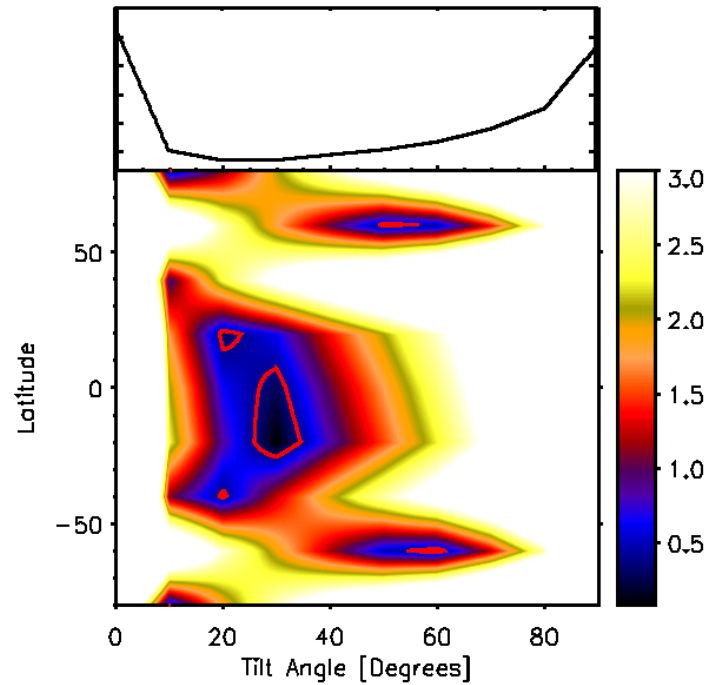


Results

Ratio of Integrated Power



Ratio of Maximum Power



CONCLUSIONS



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- Misalignment Angle Between 20° To 40° . Similar To The Ones Recovered From The Interplanetary Medium (Hundhausen 1977)
- The Sun Is No Longer A Peculiar Star

All transition images are
courtesy of SDO team

THANKS!

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