

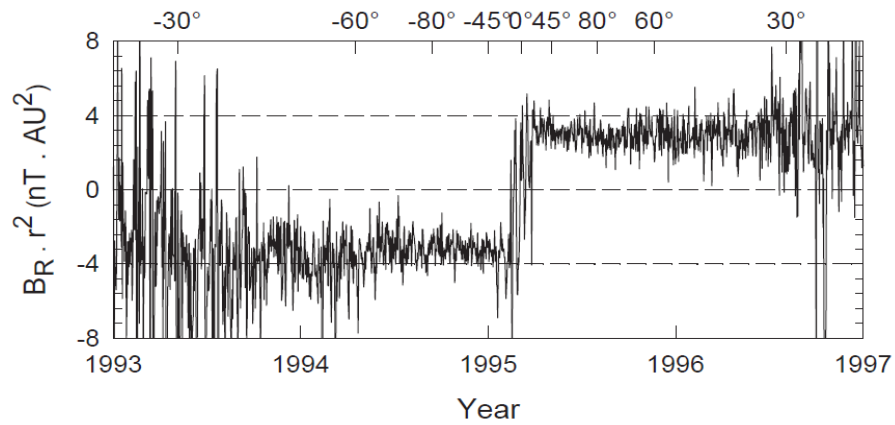
Long-term periodicities in the heliospheric magnetic flux density

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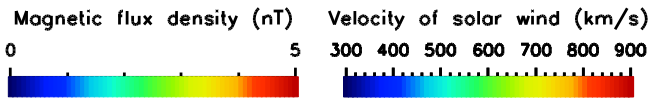
Motivation



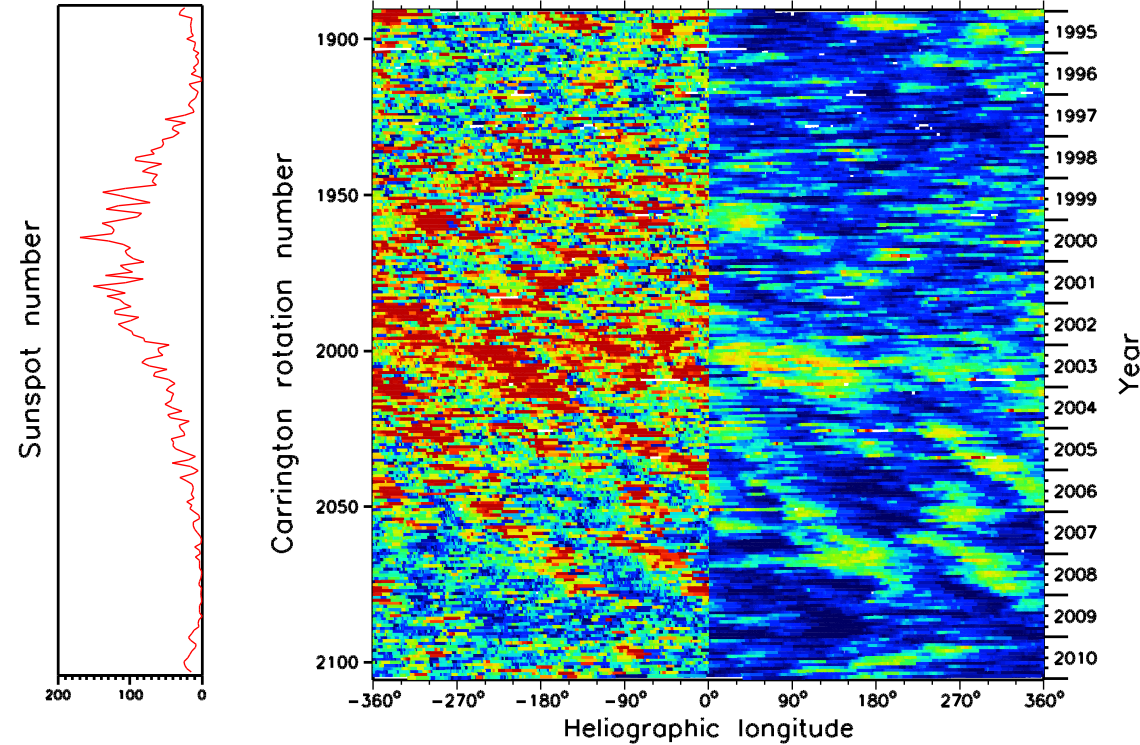
Balanced magnetic flux by **latitude** at 1 AU

What about **longitude**?

(Smith & Balogh, GRL, 1995)

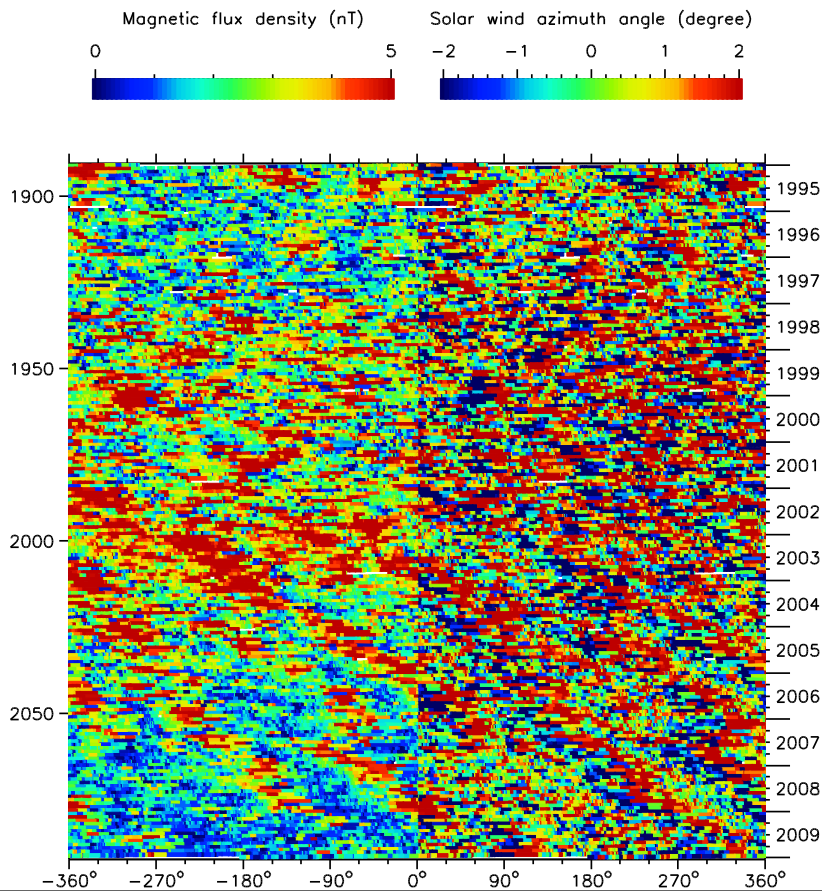


Recurring high B flux



- Recurrent variations of the magnetic flux, in particular from 2004 to 2010 lasting for several years
- Different rotation rates

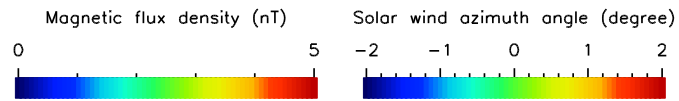
(Dósa & Erdős, ApJ 2017)



Recurring high B flux

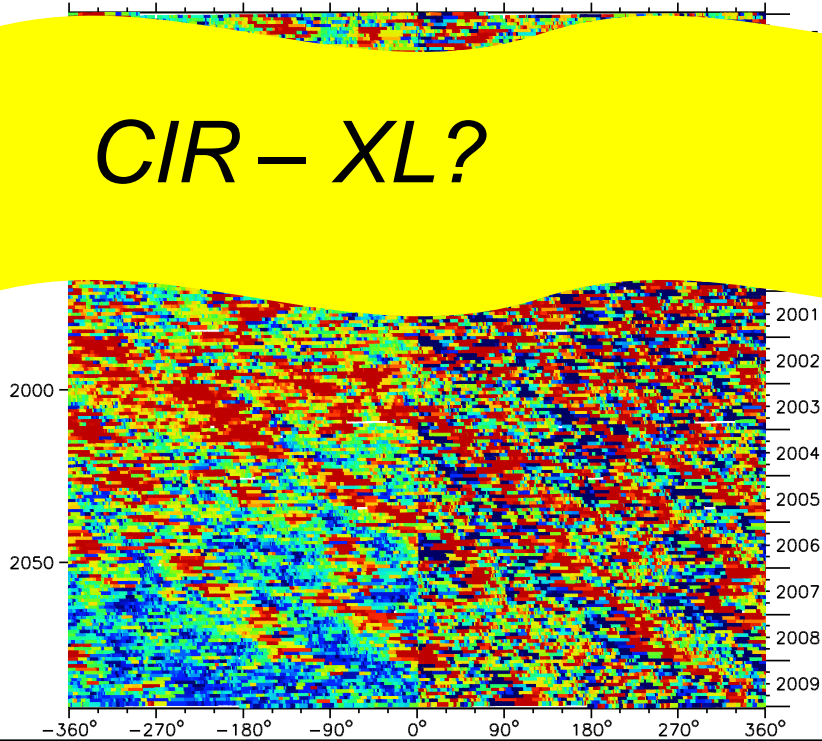
- *Deviation angle*: Correlation of high magnetic flux with slow-fast wind stream interfaces (CIR)
- *ACE coronal temperature data (O^{7+}/O^{6+})*: Higher magnetic flux does NOT occur simultaneously with coronal hole solar wind, but arrives shortly beforehand - coexists with slow-fast wind stream interface.

(Dósa & Erdős, ApJ 2017)



Recurring high B flux

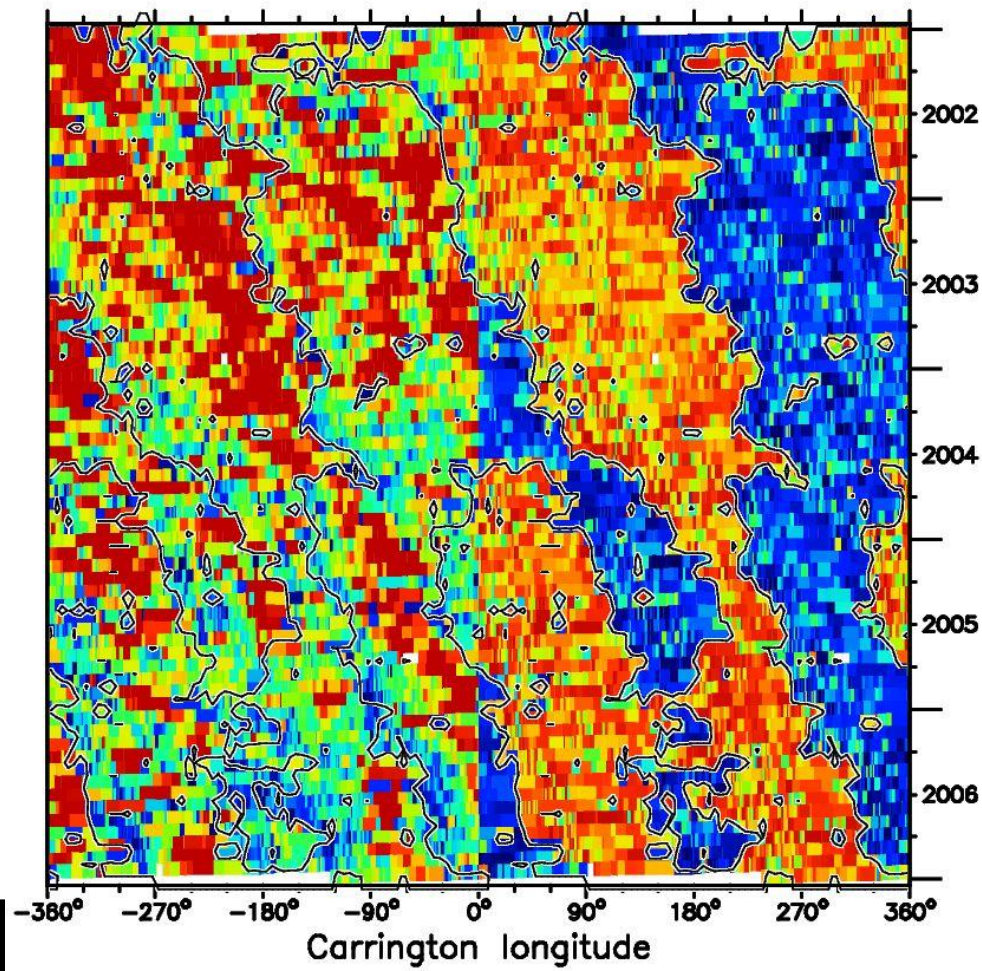
CIR – XL?



Correlation angle: Correlation of high magnetic flux with slow-fast wind stream interfaces (CIR)

ACE coronal temperature data (O^{7+}/O^{6+}): Higher magnetic flux does NOT occur simultaneously with coronal hole solar wind, but arrives shortly beforehand - coexists with slow-fast wind stream interface.

(Dósa & Erdős, ApJ 2017)



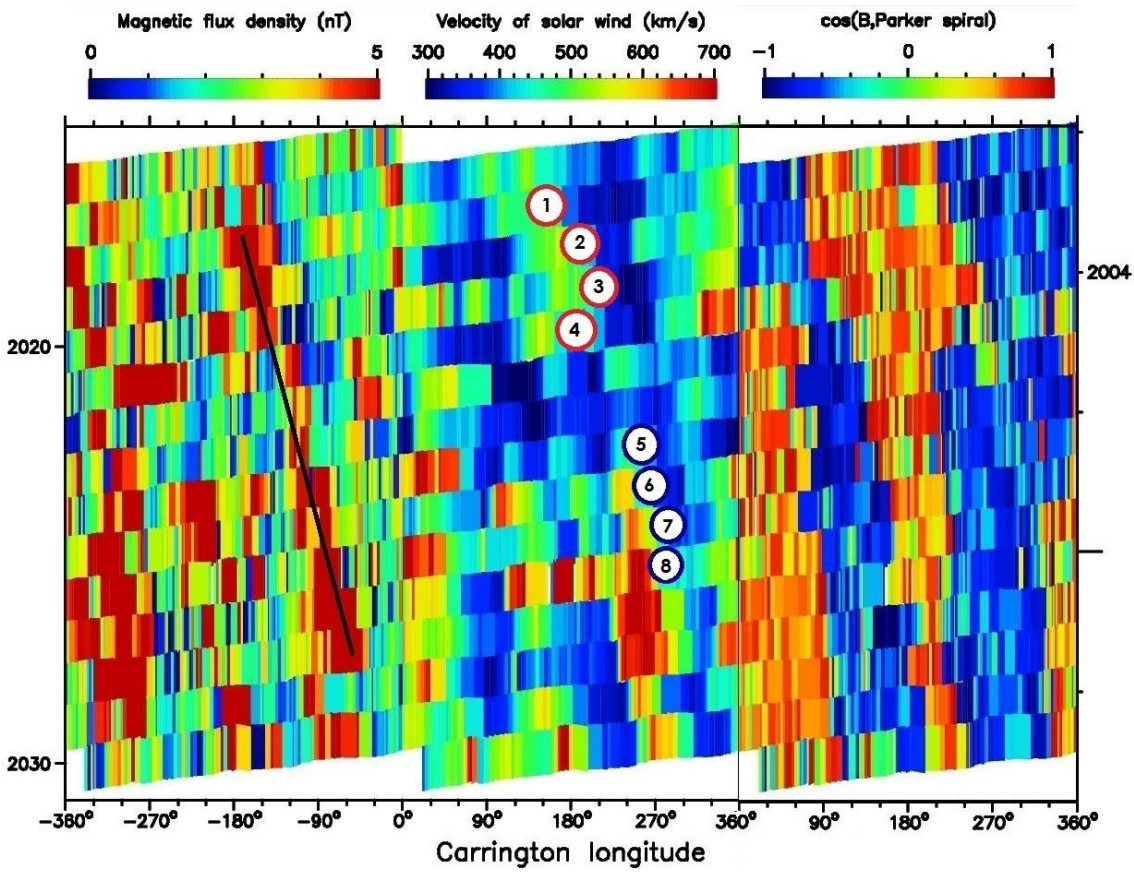
Recurring high B flux

slight correlation between B flux density enhancements and sector crossings, but

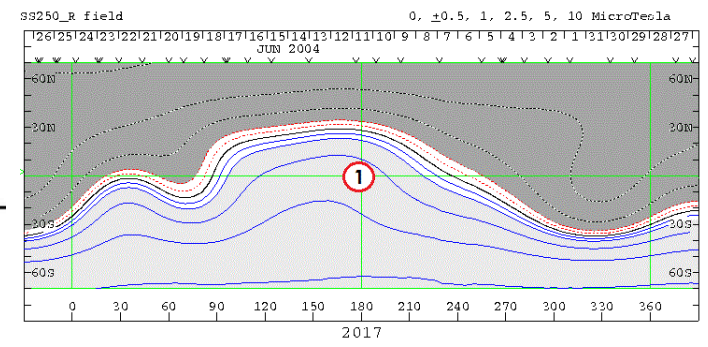
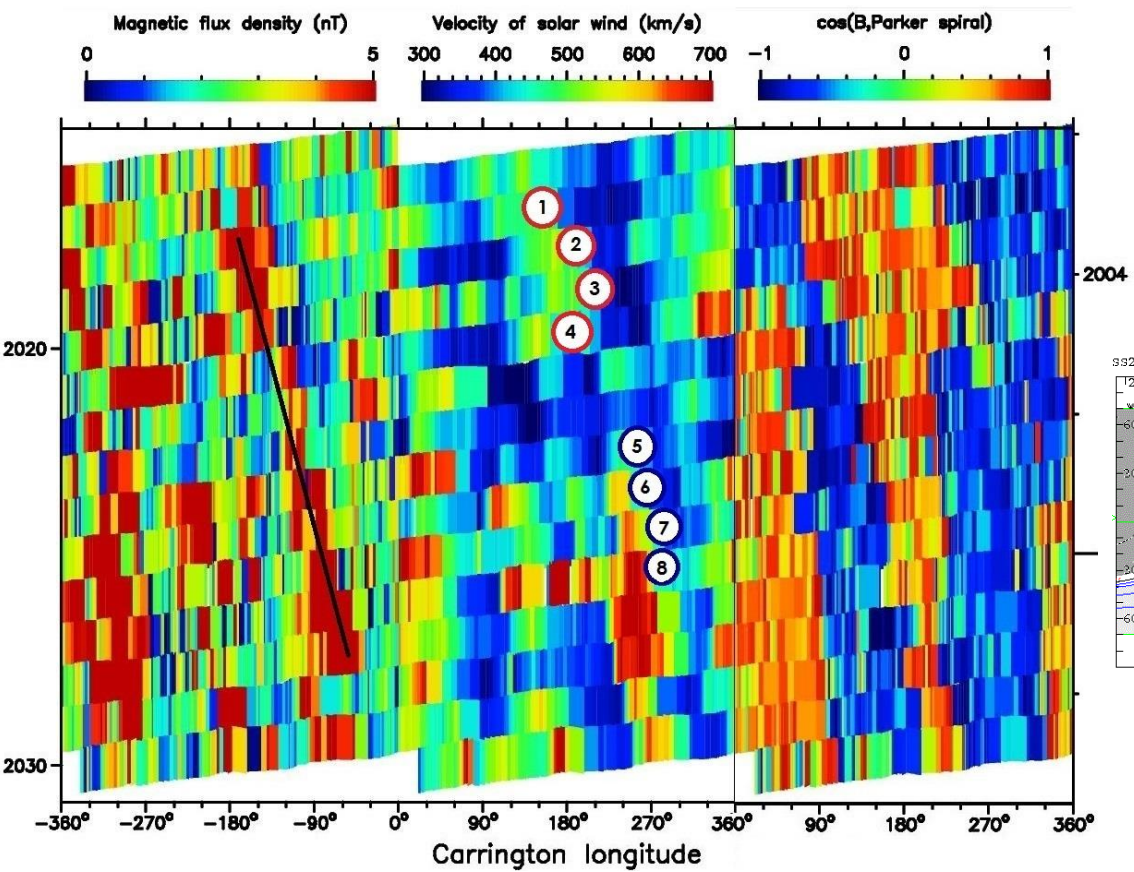
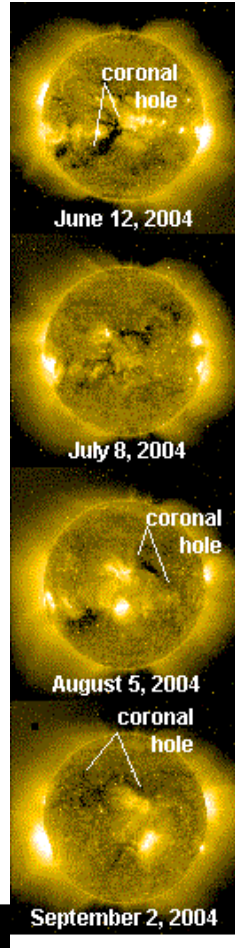
- there are sector crossings without an increase in B
- there are B increases without sector crossings.

different rotation rates

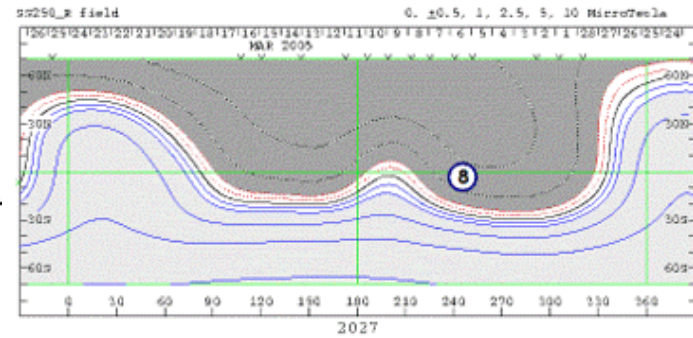
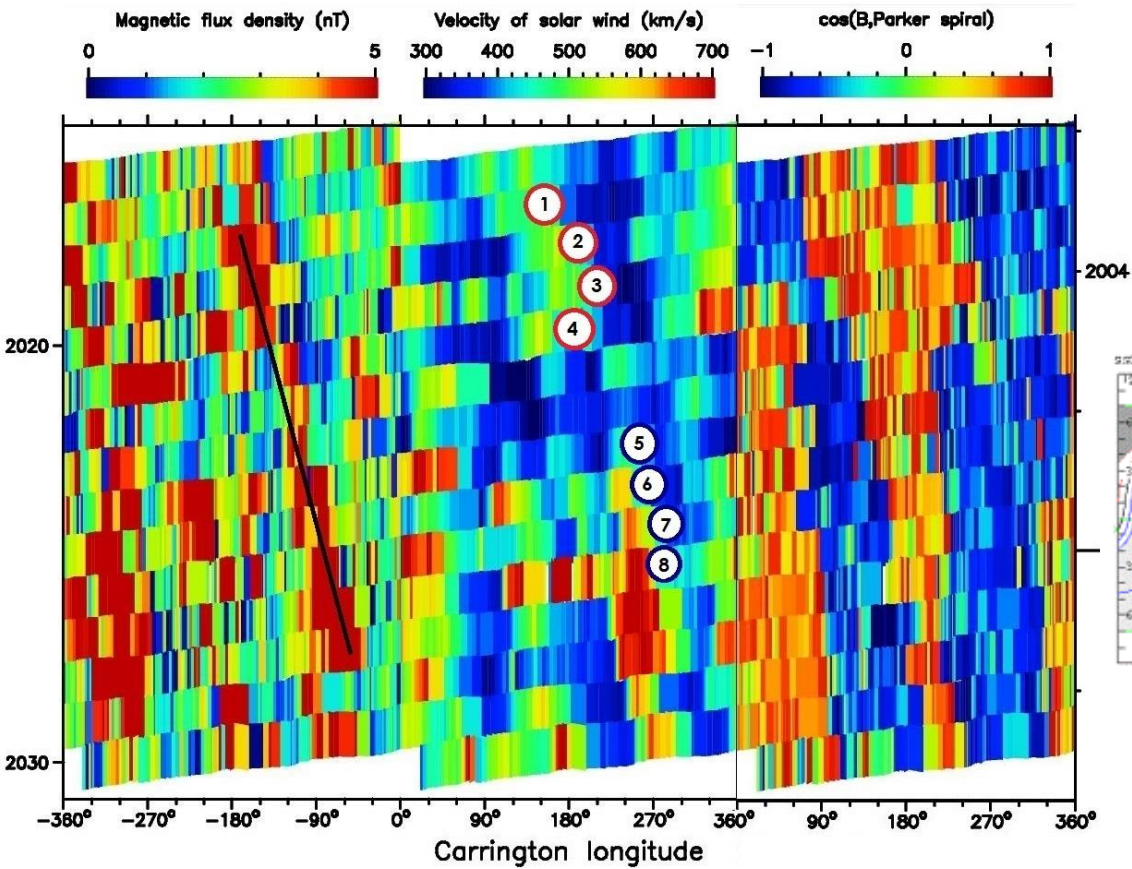
June 2004 –
March 2005



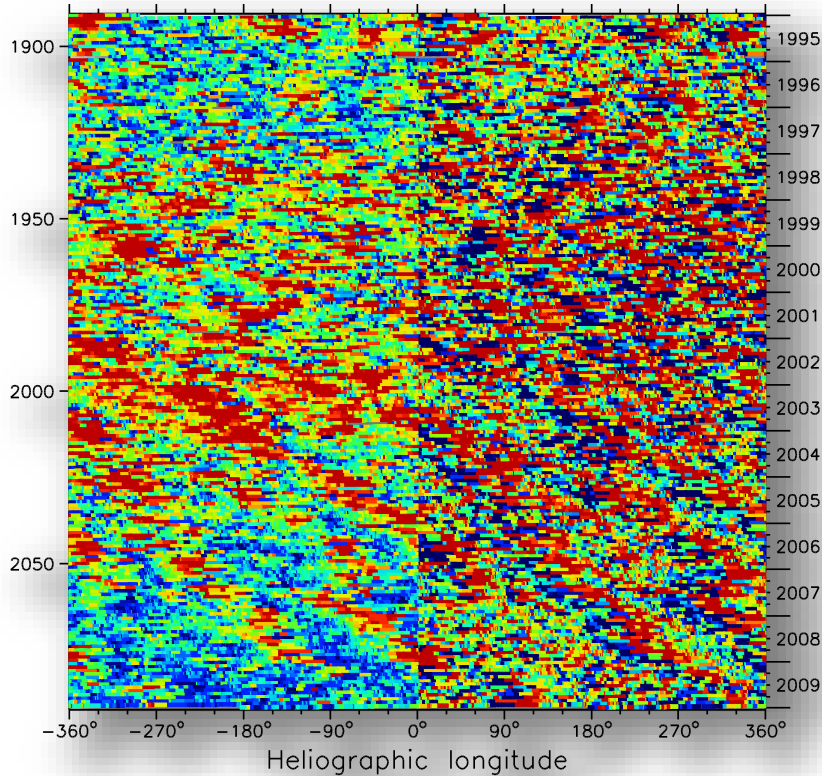
June 2004 – March 2005



June 2004 – March 2005



Conclusions, further questions



Recurrent flux enhancements are associated with high speed solar wind (CIRs).

The recurrence rate of high speed streams and magnetic sectors is not the same

- Major reorganization of the solar magnetic field?
- Are there coronal hole pairs in northern and southern hemisphere on similar longitude?
- Are there active longitudes in the corona?