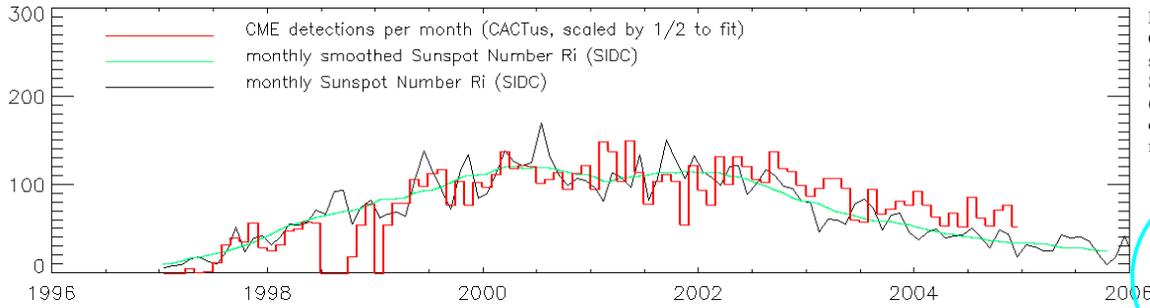


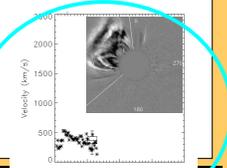


LASCO CME-catalog for 1997 - 2004 based on automated detection

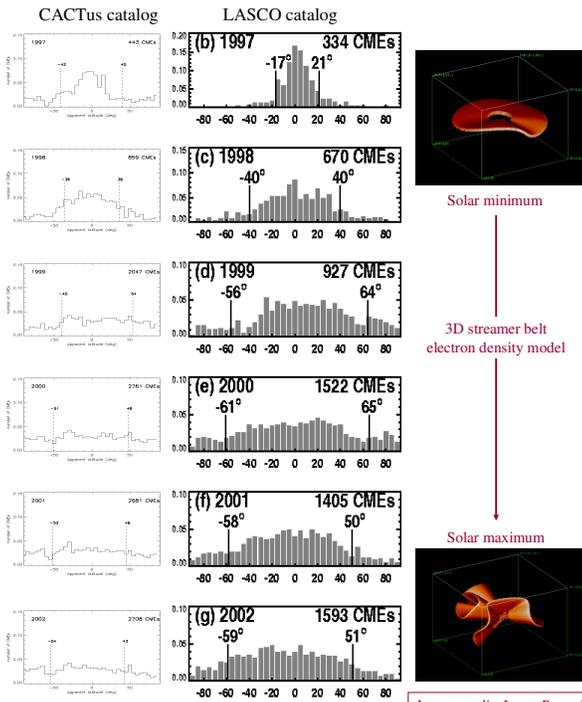
Eva Robbrecht,
D. Berghmans, R.A.M. Van der Linden



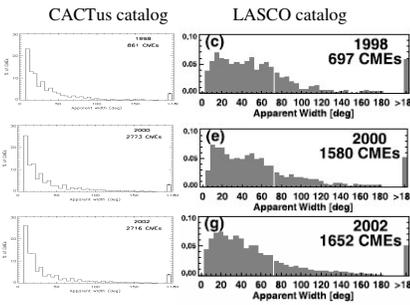
Monthly Histogram of the CACTus CME detections superimposed on the Smoothed Sunspot Number (SIDC). The CACTus detections are scaled by a factor 0.5 to fit.



Apparent CME latitude distribution over the solar cycle



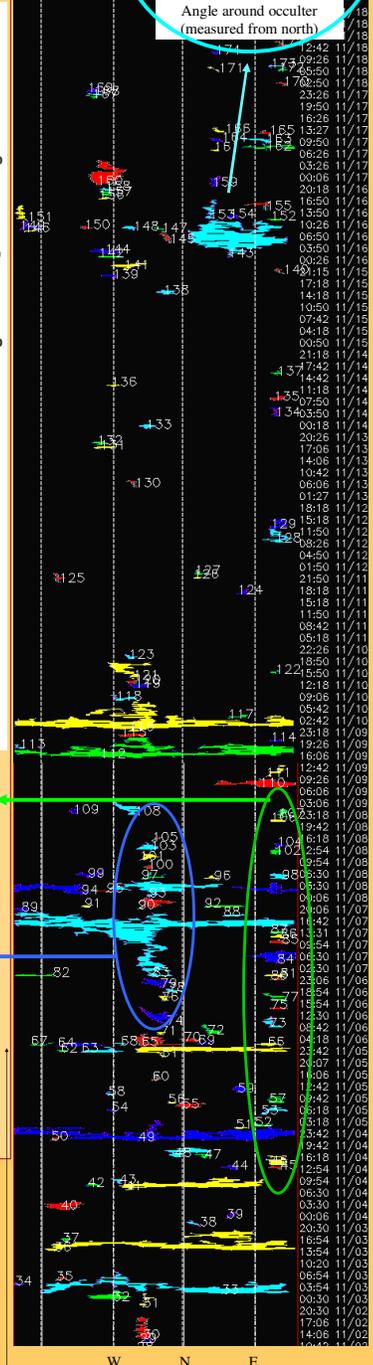
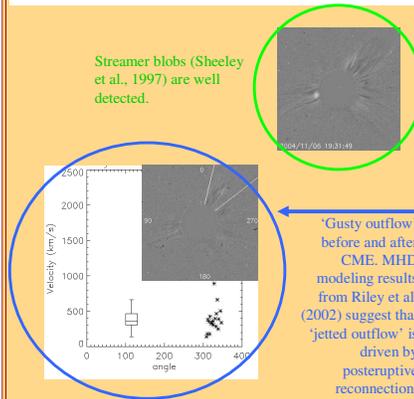
Apparent CME width distribution



-Cactus detects about 75% more 'events' than the 'classical' CMEs. The remarkable difference in distributions (left vs right) shows that indeed they are different in nature (and not just 'forgotten' by the manual detection). The extra events, detected by the automated procedure are **narrow events** (< 25°). This is attributed to the fact that CACTus (left) detects all radially outflowing intensity enhancements in addition to the 'classical' CMEs. By eye they are sometimes hardly detectable (two examples given below). They can be: streamer 'blobs', gusty outflow from AR before or after CME eruption, jets (from AR or coronal hole),

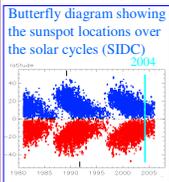
-As a consequence CACTus widths show rather exponential distribution. (Note: Lower limit set to > 8°). This hints towards 'micro-CMEs' in correspondence with the term 'micro-flares' (Parker, 1988).
*please complete the list and put your name or ref.!

Streamer blobs (Sheeley et al., 1997) are well detected.



Angle around occulter (counter clockwise)

Typical example of CACTus output



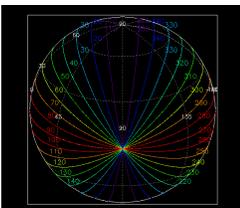
Distributions of apparent latitude:

-Good overall correspondence between CACTus (automatic) and LASCO CME (manual) catalog. However, apparent latitude from CACTus catalog displays a larger spread (variance).

-Distributions evolve with solar cycle and are consistent with the location of the streamer belt. It shows indeed, that most CMEs are not related to ARs (see butterfly diagram). This is in agreement with earlier results (Howard et al., 1985; Hundhausen et al., 1984; Yashiro et al., 2004).

-During Solar Max (e.g. 2002): CACTus distribution is quasi-uniform, different from the 'Classical' CME distribution. This indicates that 'small events' mostly come from edges of streamer belt and coronal holes (jets).

-Towards the end of the solar cycle (e.g. 2004) the CME latitudes show bi-modal distribution with peaks around ±30°.



Left: Apparent vs real latitude. One line corresponds to one 'apparent latitude' (Assumption: CMEs erupt radially)

-Right: These graphs show that narrow CMEs (included in the left) have speeds mostly < 500 km/s.
-The blue curve shows a lognormal distribution.
-The red curve illustrates how the projection effect of the sphere onto the plane of the sky can influence the distribution..

Apparent CME speed distribution

