# The IMILAST project: Natural variability in cyclone characteristics and its method dependent assessment in the Southern Hemisphere

G.C. Leckebusch[1], J. Grieger[2], M. Schuster[2], K. Keay[3], U. Ulbrich[2], U. Neu[4], and the IMILAST team
G.C.Leckebusch@bham.ac.uk

[1] UNIVERSITY OF BIRMINGHAM  [2] Freie Universität Berlin  [3] THE UNIVERSITY OF MELBOURNE  [4] sc | nat

## Backgrounds

We investigate SH cyclone development in terms of natural **inter-annual variability** and the longer-term **linear trend.**

- 20 winter seasons (AMJJAS) of ERA-Interim 1.5° data (1989-2008) of
- 12 identification and tracking methods performed by the IMILAST-Team were analyzed, concerning track density, with the
- statistics algorithm from Cyclone Tracking Software of Murray and Simmonds (1991)

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|---|---|
| M02 J. Pinto, Cologne | M15 C. Raible, Bern |
| M08 M. Liberato, Lisbon | M16 A. Cocozza, Lecce |
| M09 X. Wang, Toronto | M18 M. Sinclair, Prescott |
| M11 U. Ulbrich, Berlin; | M20 H. Wernli, Mainz |
| G.C. Leckebusch, Birmingham | |
| M12 S. Gulev, Moscow | M21 M. Inatsu, Hokkaido |
| M14 S. Kew, Zurich | M22 M. Akperov, Moscow |

12 Members

## Conclusions

- Large differences in the number of identified cyclones and cyclone tracks between the methods, similar very small hemispheric trend

- No hemispheric trends in length and strength, slight positive in number

- Similar intra-seasonal distribution of number, length, and strength

- Method-to-Method Variability: High for absolute values of mean track density

- Natural Variability:
    1. Long term trend: similar signal in method inherent results
    2. Interannual variability: similar signal in all methods

✓ Although significant differences between the method exist in absolute numbers, **the basic statements to natural variability remain robust and coherent in between the methods**

1. All methods show similar patterns, though absolute values vary – large inter- method standard deviation

In how far are methods comparable?



Ensemble Mean | Ensemble Mean | Ensemble Mean

**Relative trend** of each method  «  **Track density** of each method  »  **Relative Interannual Variability** of each method

Ens. Standard Deviation | Ens. Standard Deviation | Ens. Standard Deviation

In % of relative trend | In % of track density | In % of rel. interann. variability

2. Small but significant trends. Relative trends of single methods reveal similar magnitudes – small inter method standard deviation in regions of significant trend.

3. Spatial patterns of inter-annual variability are coherent. The relative inter-annual standard deviation is comparable in magnitude between different methods.