The precipitation regime of Dronning Maud Land, Antarctica, derived from AMPS (Antarctic Mesoscale Prediction System) archive data

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Investigation of precipitation regime of DML using **AMPS** (Antarctic Mesoscale Prediction System) 
(with NCAR: Jordan Powers, Michael Duda, Kevin Manning)

Investigation of 65 shallow firn cores (10-160m) from DML 
(with NPI: Elisabeth Isaksson, and AWI: Hans Oerter)
Ice Cores

- very successful in paleoclimatology
- climatic information from ice cores in Greenland and Antarctica, „EPICA“
Stable isotopes of snow and ice

Stable oxygen isotope ratio of ice (water, snow): $\delta^{18}O$

used to derive paleo-temperature

**BUT:** depends on: processes during evaporation and condensation

Thus: we must understand precipitation history!
AMPS (Antarctic Mesoscale Prediction System)

AMPS archive: 5.1.2001 – today

**disadvantages:** only < 7 years available
- many changes and adaptations
- no re-analysis (yet)

**advantages:**
- high resolution
- circumpolar
- made and tested for practical purposes
- responsible people very nice 😊
AMPS – „climatology“

Monthly precipitation Nov. 2001
AMPS output (!) for AWS location
Case study

22.-25. February 2003:

High precipitation amounts at all AWS and core locations
Sea level pressure and 500hPa geopotential height

22 Feb

23 Feb
Sea level pressure and 500hPa geopotential height

24 Feb

25 Feb
precipitation

22 Feb

23 Feb

24 Feb

25 Feb
Sea ice extent and concentration anomalies, Feb 2003
(Data courtesy: National Snow and Ice Data Center, CO.)
Outlook

Comparison AWS – AMPS

Independent model evaluation using Dutch AWS und Dome F daily precipitation measurements

problem: wind!

Case studies of all „major“ events find (?) similarities in synoptic patterns correlation with sea ice extent?
Thanks for your interest!