

Paleolatitude estimate of the Ordovician glaciation in South Africa and Gondwana motion during the Paleozoic

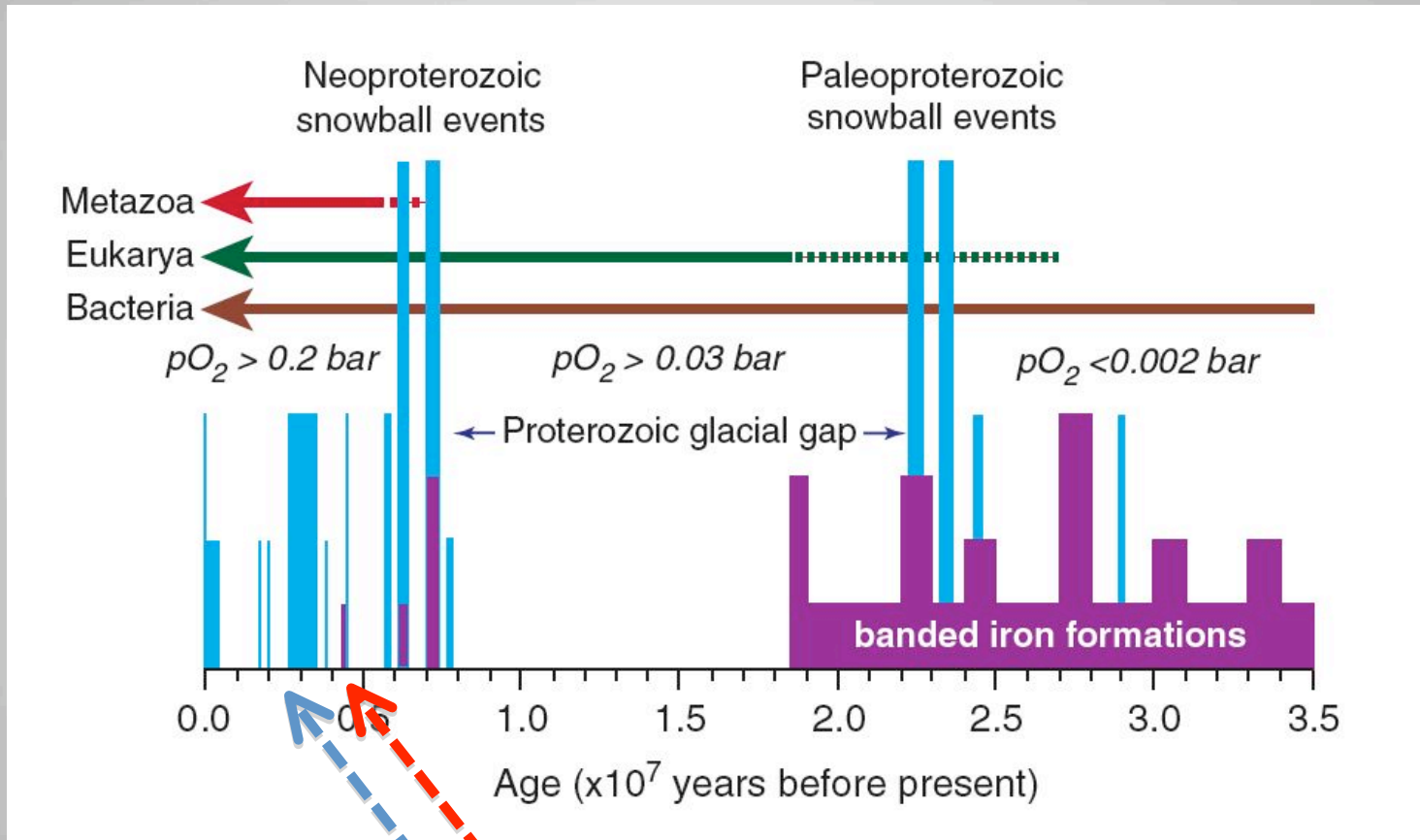
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Earth Glaciations

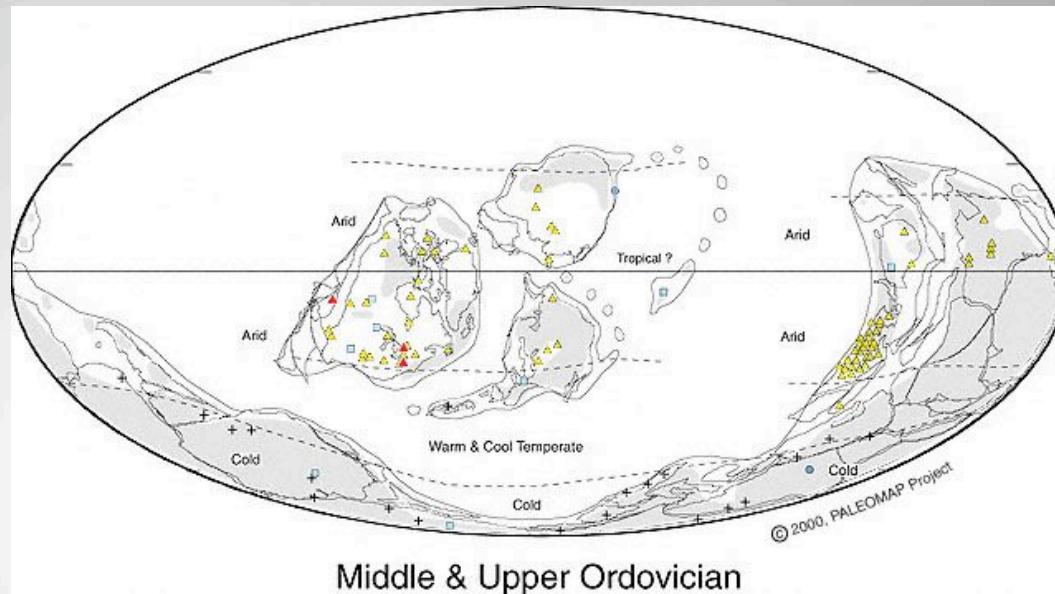
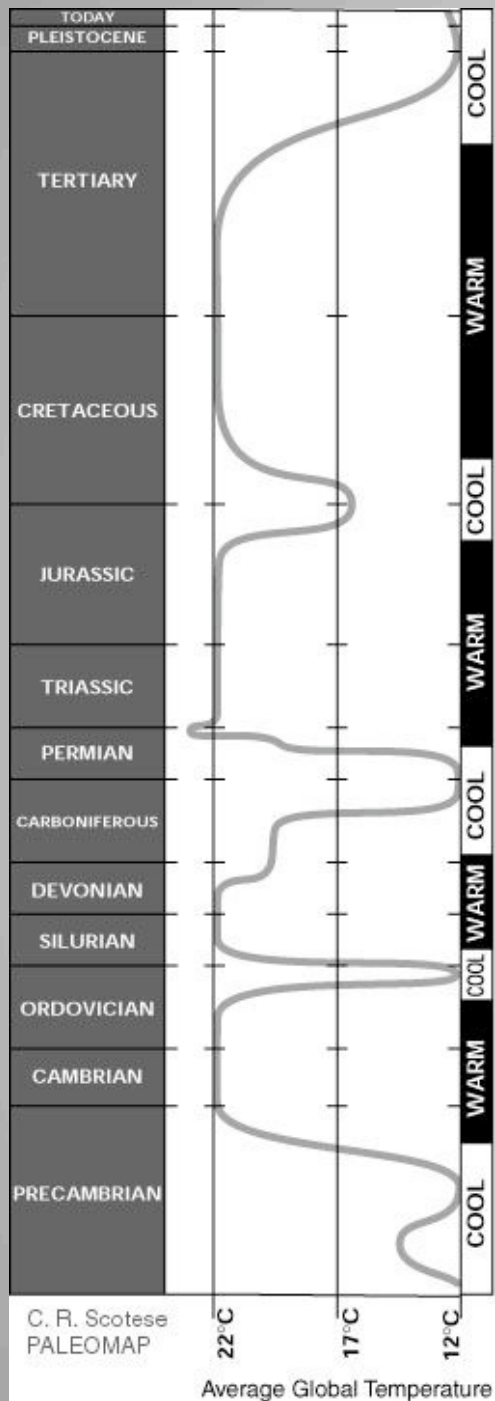
Several episodes of main glaciation



Permo Carboniferous glaciation / Ordovician glaciation

From Hoffman and Shrag 2002

The Ordovician glaciation as not been already investigated...



CARBONIFERE

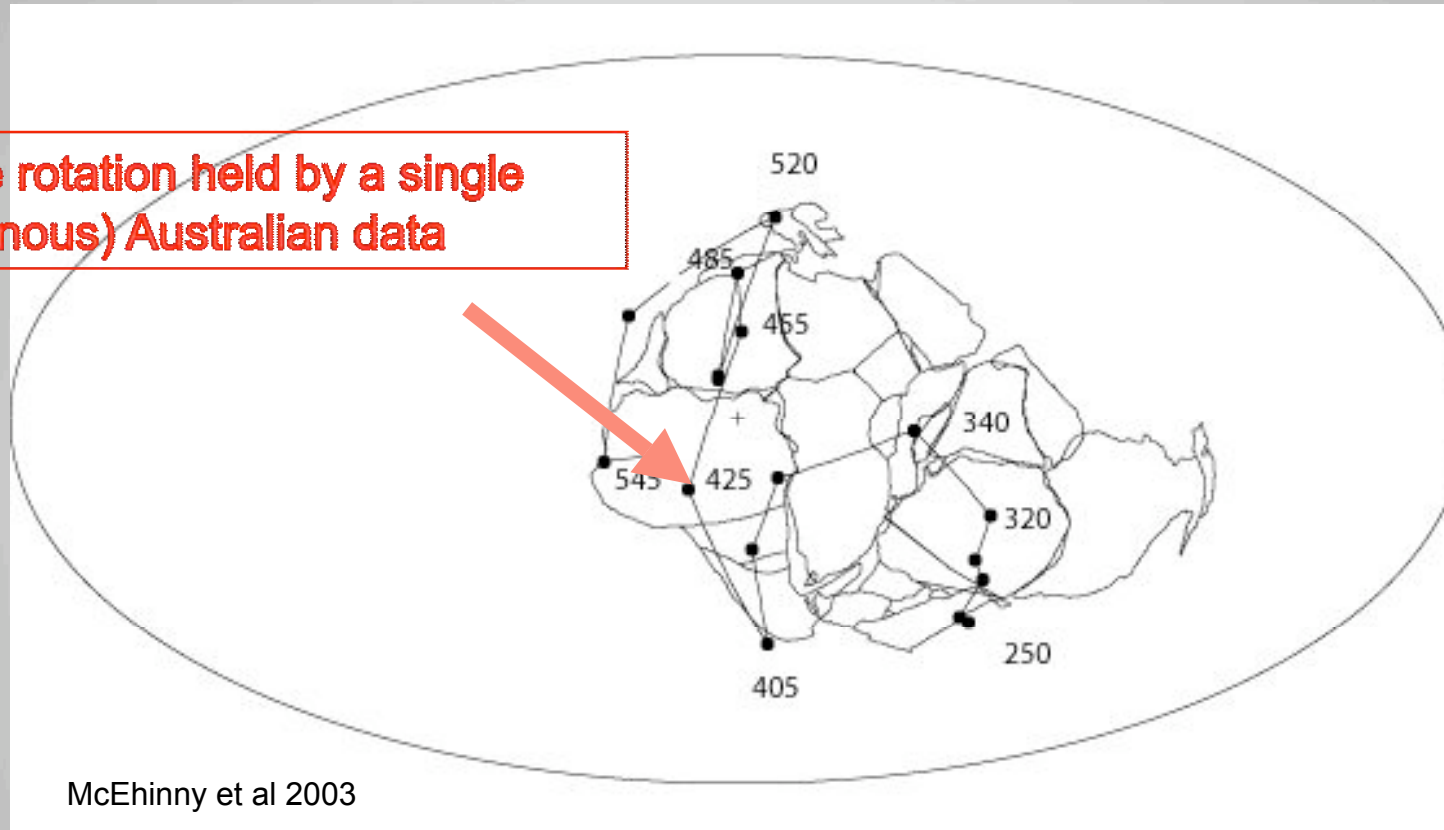
ORDOVICIEN ?

C.R. SCOTESE 2000

- Gigantic Ice sheet calotte in South America and Africa
- Major episode of glaciation possibly short (some My).
- ¹³C et ¹⁸O isotopic excursions

Paleozoic APWP (apparent polar wandering path)
for Gondwana
≈ Position of the earth's rotation pole

90° plate rotation held by a single
(allochthonous) Australian data



-Important uncertainties on pole positions

-We do not know exactly where was the geographic pole between 455 and 400 Ma

-Fast motion of plates during Late Precambrian/Early Paleozoic ?

Period	Formation / Group	Thickness (m)	Fossils and References
Permian	Ecca F. (ss+sh)		
Permian	Dwyka F. (diam)	700	Invertebrates, fish, palynomorphs, plants (42)
Carboniferous	Witteberg Grp. (ss+sh)	1300	(42) Paleoniscid fish (29) Mega+miospores (30,31) * Tropidoleptus (28)
Devonian	Bokkeveld Grp. (ss+silt.+sh)	1500	* Zosterophyllum (26) + invertebrates (27)
Silurian	Nardouw F. (ortho-ss)	1100	No body fossils
Silurian	Cedarberg (sh)	140	* Invertebrates + plant spores (21,24)
Silurian	Pakhuis (diam)	150	* Invertebrates + plant spores (21,24)
Ordovician	Peninsula F. (ortho-ss)	1800	No body fossils
Ordovician	Graafwater (ss+sh)	440	* Trace fossils (16)
Ordovician	Piekenierskloof (congl.)	0-800	No fossils
Cambrian	Klipheüvel	300-2000	No fossils
Cambrian	Younger Cape Granite		Pb/Pb isochron 530±15 Ma (15)

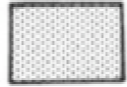


30°S

CAPE SUPERGROUP



WITTEBERG GROUP



BOKKEVELD GROUP

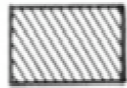


TABLE MTN. GROUP

30°S



Pakhuis Pass

Gydo Pass

Swarmoed Pass

Worcester

Hex River Pass

CAPE TOWN

Rooihogte Pass

Kogmanskloof

Ashton

Montague

34°S

Chapman's Peak



PORT ELIZABETH

34°S







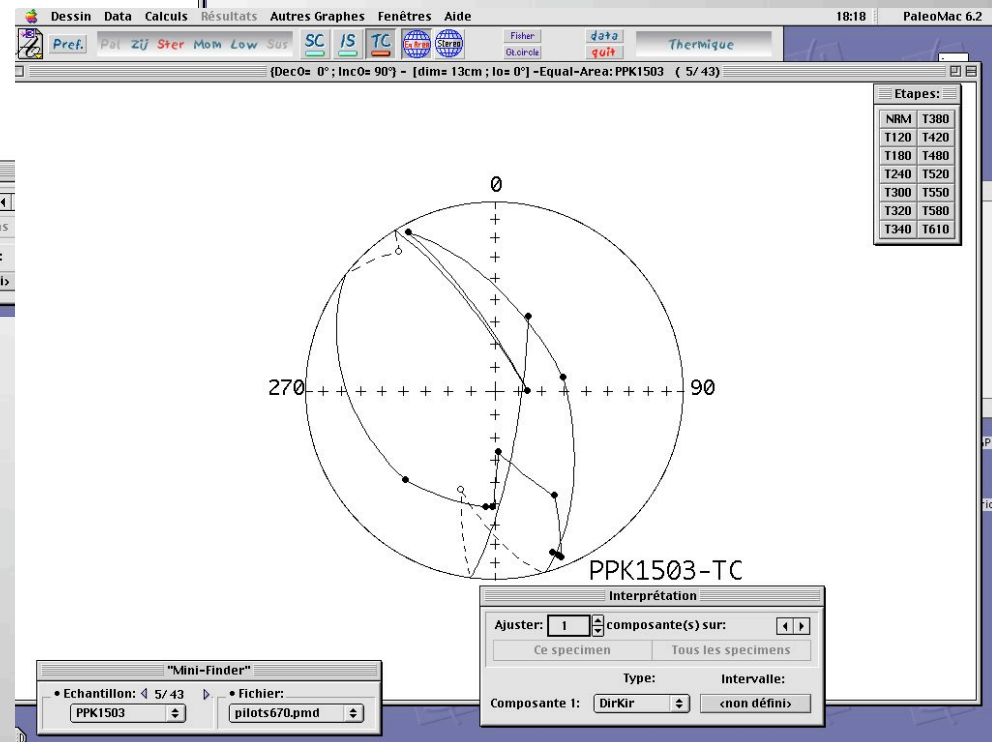
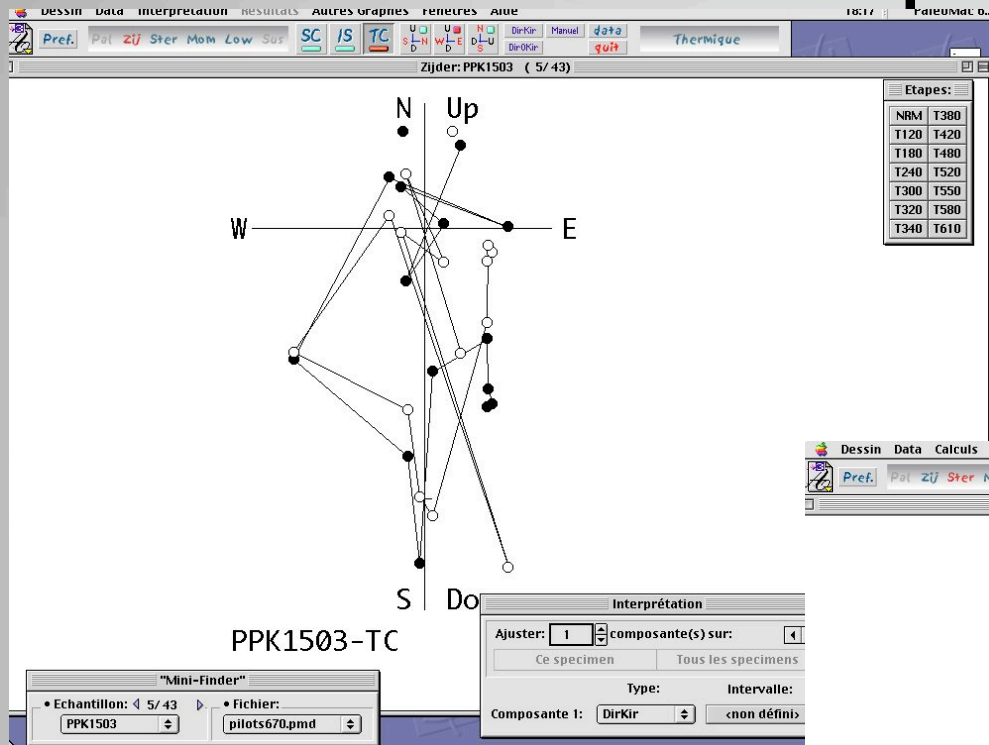


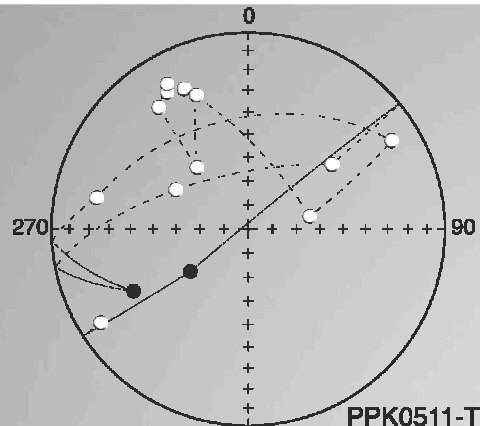




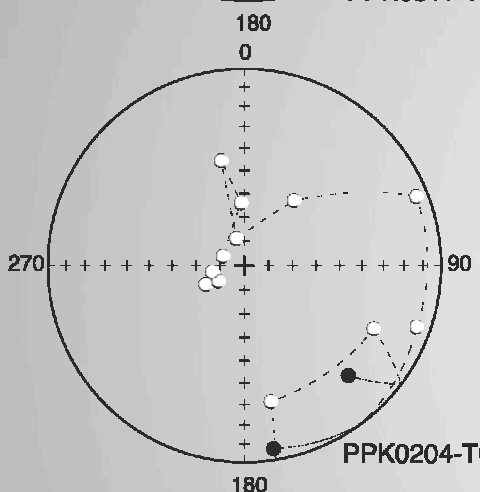
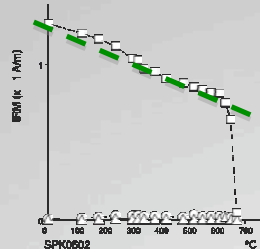


Demagnetization of a Pakhuis sample

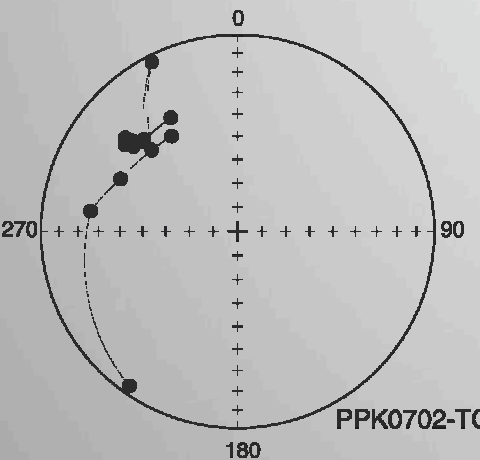
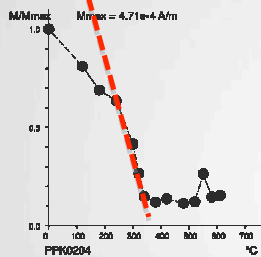




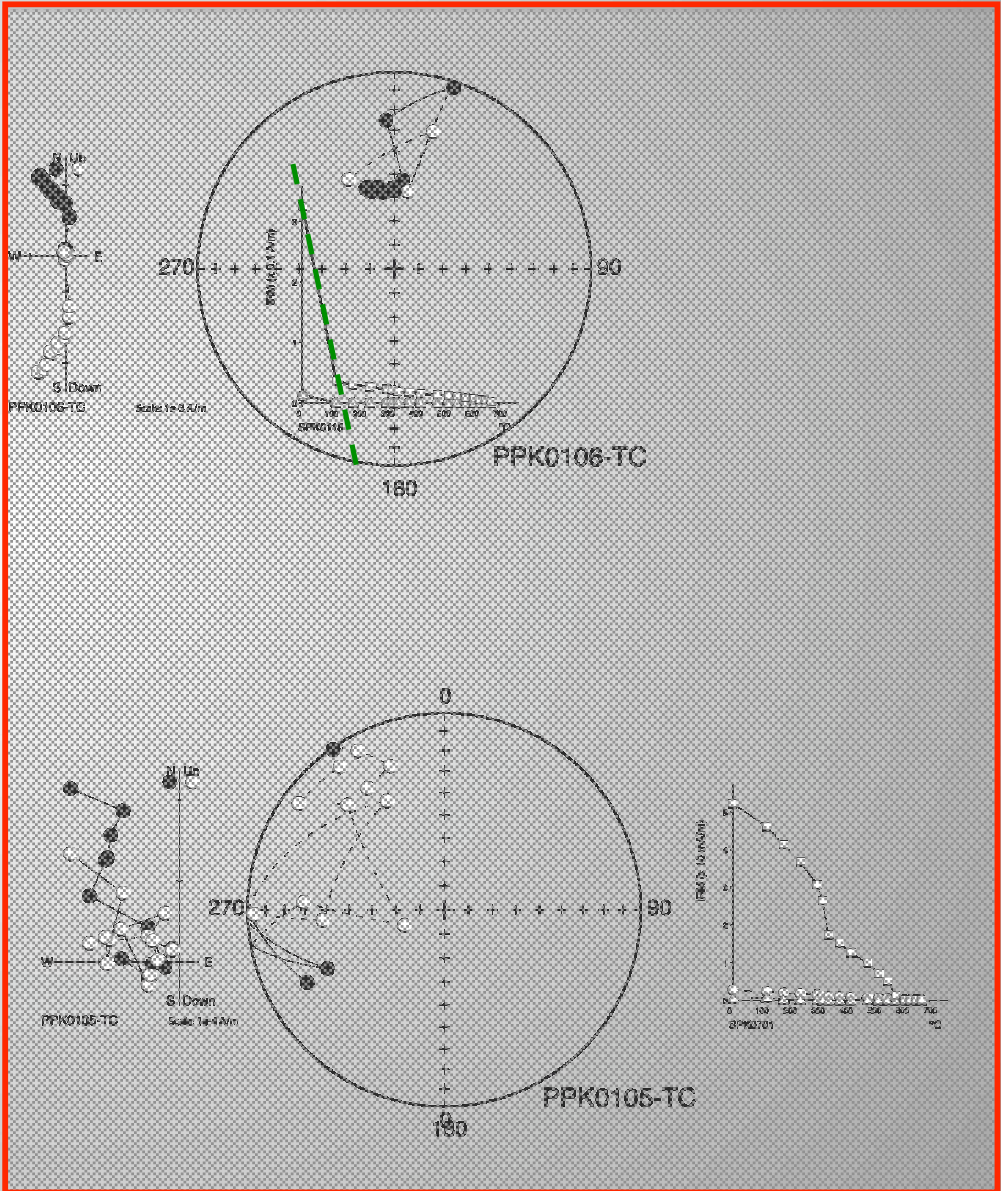
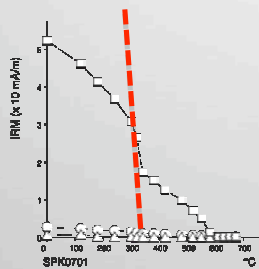
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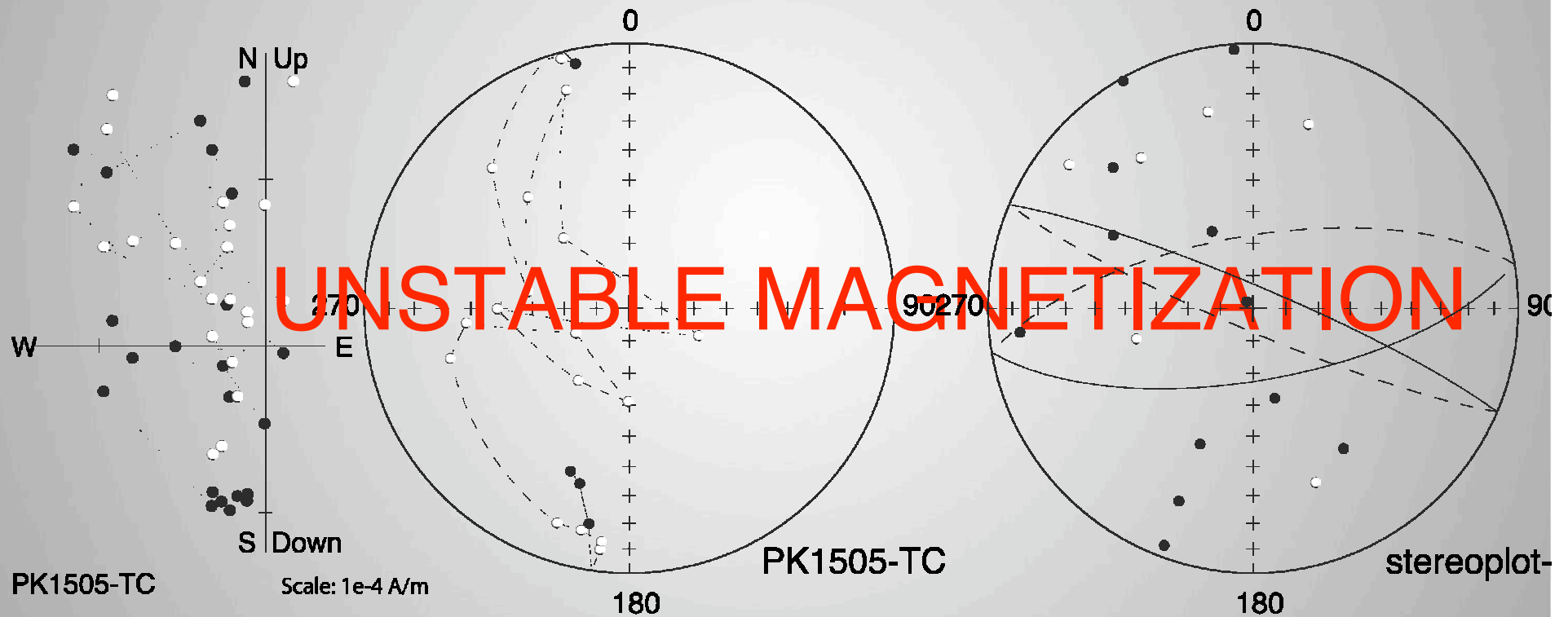
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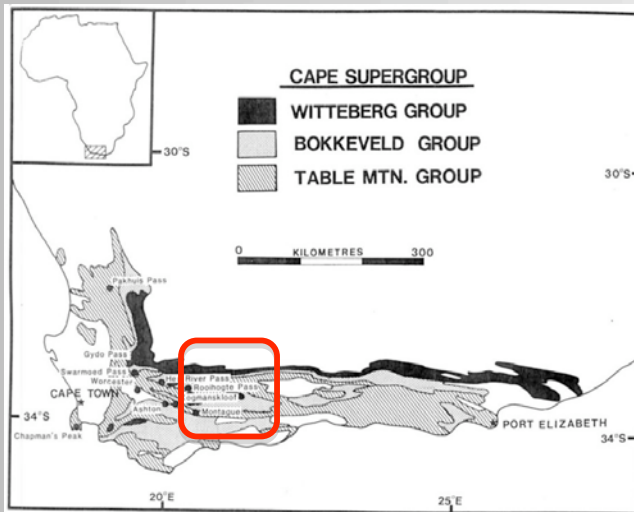


Pakhuis Thermal Demagnetization (till 310°C)+Alternating fields



Conclusions

- No stable magnetization could be isolated
- New sampling of the tillite?



- Other rock magnetic investigations
- Sampling of other rock type at the base of Pakhuis fm. (Sandstones)
- South African paleomagnetician on this project?