EGU 2020 Sharing Geoscience Online - D3057 | EGU2020-16042

Identification of source-sink relationships in southern Africa by stable water isotopes analyses and Lagrangian moisture source diagnostics



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Aims

- ? Identify principal moisture source areas for precipitation over southern Africa
- ? Assess influence of different transport patterns on the isotopic composition of precipitation
- ! Derive a modern analogue for palaeoclimate isotope studies in this region

- **Preliminary Conclusions**
- > Transport patterns related to: ITCZ, SE trades, Westerlies, a high pressure area above Angola
- > Effects of topographical forcing clearly visible in isotopic composition
- > Partly strong influence of evaporation on isotope ratios of rain droplets and surface waters



References

orschungsgemeinschaft

Dr. Kai Hartmann (HA 4368/3-1) Prof. Dr. Frank Riedel (Ri 809/34-1 SAHRA (2005): Isotopes & Hydrology. Available online at http://web.sahra.arizona.edu/programs/isotopes/oxygen.html Sprenger, M.; Wernli, H. (2015): The LAGRANTO Lagrangian analysis tool - version 2.0. https://doi.org/10.5194/gmd-8-2569-2015.

Sodemann, H.; Schwierz, C.; Wernli, H. (2008): Interannual variability of Greenland winter precipitation sources: Lagrangian moisture diagnostic and North Atlantic Oscillation influence. https://doi.org/10.1029/2007JD008503

Chevalier, Manuel; Chase, Brian M. (2016): Determining the drivers of long-term aridity variability: a southern African case study. https://doi.org/10.1002/jgs.2850.

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Preliminary Results