Peter Mills

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- **Languages**: English, some German and French
- **Citizenship**: British/Canadian

Education

- 2004 MSc. Environmental Physics, University of Bremen
- 2000 BSc. Physics, University of Waterloo

Experience

- 2010-2011 **University of Waterloo**. Retrieving carbon dioxide sources and sinks from satellite data. Developed a method for dynamical tracer reconstruction from sparse measurements called, "Principal component (PC) proxy tracer analysis."
- 2007-2009 **University of Bremen**. Sea ice emissivity modelling and application to SMOS-Ice project. Corrected existing models and clarified many of the issues in microwave emissivity modelling of sea ice; showed that both ice ridging and the radiometer footprint contribute significantly to the signal and that to correctly model the phenomenon at L-band, wave dynamics must be employed. Designed a model for the third Stokes component. Compiled final report.
- 2005-2006 **University of Northern British Columbia**. Predictability of El Nino/ Southern Oscillation (ENSO). Started work on a simpler, more versatile ocean circulation model written in C++.
- 2003-2005 **University of Bremen**. Water vapour retrieval from satellite microwave radiometry data. Developed Lagrangian tracer models, including contour advection. Compared contour advection simulations with water vapour isolines retrieved from Advanced Microwave Sounding Unit (AMSU) data. Showed that: 1. a discrete retrieval ("Isoline Retrieval") is optimal for validation of advected contours and, 2. many of the fine-scale filaments typical of contour advection simulations show up in the retrievals as areas of reduced probability. Designed kernel-based statistical classification algorithms ("Adaptive Gaussian Filtering") ideally suited to the retrieval task.

- 2001-2002 **Computational Physics Inc.** On-site contractor at the Naval Research Laboratory, Washington D.C. Operational retrievals for Polar Ozone and Aerosol Measurement (POAM) III instrument. Improved the speed, simplicity and reliability of operational codes. Developed easy-to-use software tools for monitoring the status of the instrument.

Selected publications

- **Peter Mills** and Georg Heygster (2012). "Sea ice brightness temperature as a function of ice thickness; Computed curves for AMSR-E and SMOS (1.4 to 89 GHz)." Final report DFG project HE-1746-15, arxiv:1202.3802.
- **Peter Mills** (2012) "Principal component proxy tracer analysis" arxiv:1202.1999.
- **Peter Mills** (2011) "Efficient statistical classication of satellite measurements." *Int. J. Remote Sens.*, **32** (21): 6109-6132.
- **Peter Mills** and Georg Heygster (2011). "Sea ice emissivity modelling at L-band and application to 2007 Pol-Ice campaign field data." *IEEE Trans. Geosci. Remote Sens.* **49** (2): 612-627.
- G. Heygster, S. Hendricks, L. Kaleschke, N. Maass, **P. Mills**, D. Stammer, R. T. Tonboe and C. Haas (2010). *L-Band Radiometry for Sea Ice Applications.* Final report, ESA/ESTEC contract 21130/11/EL/NL, Institute of Environmental Physics, University of Bremen.
- **Peter Mills** (2009). "Isoline retrieval: An optimal sounding method for validation of advected contours." *Comp. Geosci.* **35** (10): 2020-2031.

Other activities

- **Free software projects**:
  - *libagf*: a library for adaptive kernel density estimation; `http://libagf.sf.net`
  - *ctraj*: C++ codes for atmospheric trajectory integration; `http://ctraj.sf.net`
  - *msci*: miscellaneous projects; `http://msci.sf.net`
- **Reviewer** *Int. J. Remote Sens.*, *J. Mach. Learn. Res.* and *Pattern Anal. Appl.*
- **Interests**: travel and adventure, philosophy, outdoor sports, reading and writing.