1116-86-2557 **Adam H Monahan***, monahana@uvic.ca, and **Amber Holdsworth** and **Timothy Rees**. *The Probability Distribution of Near-Surface Wind Speed in Stably Stratified Conditions.*

The variability of near-surface winds exerts a leading order influence on surface fluxes of mass, energy, and momentum - and is in turn influenced by these surface fluxes. While there is a long history of empirically-based probabilistic models of near-surface wind variability, relatively little physical attention has been paid to this problem until recently.

In this talk, I will discuss how we have been using approaches from nonlinear time series, dynamical systems, and stochastic differential equations in the development of physically-based probabilistic models of near-surface wind variability, with a focus on the influence of near-surface stratification. Conditions of stable stratification (such as are common over sea ice) will be shown to be particularly interesting: we will demonstrate that observations of the temperature and wind structure in these conditions are characterized by two distinct states (the very stable and weakly stable boundary layers). Idealized models of the near-surface momentum and energy budgets will be used to study the physical origin of these regimes and of transitions between them. In particular, we will discuss a destabilizing feedback resulting from the existence of a maximum sustainable turbulent heat flux under stable stratification. (Received September 22, 2015)