Geophysical Research Abstracts
Vol. 18, EGU2016-4399, 2016
EGU General Assembly 2016

Modelling the deformation and force balance of anisotropic Arctic Sea Ice

Harry Heorton (1), Daniel Feltham (1), Michel Tsamados (2), and David Schroeder (1)
(1) CPOM, Reading University, Reading, UK, (2) CPOM, UCL, London, UK

The movement and spatial distribution of Arctic sea ice is due to its response to external forces. The deformation of Arctic sea ice is observed to have structural alignment on all length scales. By considering the alignment of diamond-shaped sea ice floes an anisotropic rheology has been developed for use in a climate sea ice model. Here we present investigations into the role of anisotropy in calculating the internal stress gradient of Arctic sea ice over climate length and time scales in a state-of-the-art climate sea ice model, the Los Alamos Sea Ice model. Our investigations are focused on the link between the external dynamical forcing and the emergent properties of sea ice such as its drift speed and thickness distribution. We analyse the model's response to external forcing over short time scales showing the characteristics of deformation events for different sea ice states and anisotropic alignment. We show how these events add up to produce the full seasonal stress balance and sea ice state over the Arctic ocean.