



Observed and Simulated Arctic ice drift from IPY

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Recent buoy drift collected in the Arctic basin provides a much higher resolution, especially in time but also in space, than previously collected buoy data. Consequently it provides a greatly enhanced capability for determining the tidal and inertial variability in sea ice drift and deformation. Combination of this data with more precisely processed ice stress data also provides a means for determining tidally and inertially forced stress variations. In this paper a detailed analysis, with special focus on the Beaufort sea is given on ice kinematics (especially high frequency variability) in the Arctic Basin based on this data set. In addition simulations using a recently developed embedded ice ocean tidal model (Hibler et. al, 2007) are carried out over the same time period as these observations. Detailed comparisons of the simulated and observed results using most notably rotary spectral and cross spectral analysis techniques are carried out to ascertain and verify detailed physics in the model and theoretical amplification effects, and to examine role of nonlinear sea ice mechanics in modifying Arctic tidal currents and the role of such currents in modifying sea ice drift and deformation. Comparisons are also made to non imbedded 'levitated' ice ocean models as currently used for example in the CCSM (NCAR).