Geophysical Research Abstracts
Vol. 14, EGU2012-1577, 2012
EGU General Assembly 2012
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Asymmetric tide in Spitsbergen fjords

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We analyze measurements of surface elevations, currents, and CTD profiles in the fjords and inlets of Spitsbergen. The tides in the inlets are asymmetric, which means that the durations of the flood and ebb phases are different. Causes of observed asymmetry are analyzed. Strong tidal currents in the strait connecting the open ocean with the Van Mijen Fjord can be as high as 3 m/s, which cases difficulties for the navigation in this channel for the ships transporting coal from Spitsbergen mines. We also analyze observations in a narrow channel (10 m wide) connecting the Van Mijen Fjord with the Valunden Lake where strong asymmetry is observed. The tidal currents exceed 1 m/s.