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Interactive comment on "Results from the DAMOCLES ice-buoy campaigns in the transpolar drift stream 2007–2009" *by* M. Haller et al.

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This is an interesting manuscript presenting kinematic analysis of sea ice based an extensive buoy data collected during the IPY. The data analysis has been conducted in a proper manner. The authors present new results, in particular they analyse response of pack ice for the cyclones and anticyclones. These results have a wide interest for the polar research community. However, there is room for improvements and a major revision is needed. My specific comments are

Major points :

1) Authors should compare their results on the long term climatology, just to mention that drift speed of "Tara" was three-fold compared to "Fram" is not very scientific. I

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recommend that the authors calculated long term statistics from the IABP database or Russian NP-station observations and use that as for baseline of their analysis.

2) Discussion of the results need to be deepened. Presently, authors rather cursory explain drift characteristics and relationship between the geostrophic wind and ice motion. For example, tables 2 and 3 show interesting seasonal and regional differences and the authors should try to relate these differences on the pack ice thickness and concentration. One source of ice thickness data is the IceSat products, see http://rkwok.jpl.nasa.gov/icesat/index.html.

3) The case study analysis (impact of single storm on sea ice conditions) should also be expanded. According to the table 5, there is significant meso-scale differences in deformations. Authors could place local deformation changes along the cyclone path and discuss on length scale of deformations.

4) Authors have neglected many of the important articles. I think that the following papers are relevant for this manuscript and the authors should compare and relate their findings on these earlier contributions.

Kwok, R., G. Spreen, and S. Pang (2013), Arctic sea ice circulation and drift speed: Decadal trends and ocean currents, J. Geophys. Res. Oceans, 118, doi:10.1002/jgrc.20191.

Hutchings, H.K., A. Roberts, C.A. Geiger, and J. Richter-Menge, 2011: Spatial and temporal characterisation of sea ice deformation, Annals of Glaciology, 52 (57), 360 – 368.

Rampal, P., Weiss, J. & Marsan, D. (2009). Positive trend in the mean speed and deformation rate of Arctic sea ice, 1979-2007, Journal of Geophysical Research, 114, C05013; doi: 10.1029/2008JC005066

Rampal, P., J. Weiss, D. Marsan, R. Lindsay, and H. Stern (2008), Scaling properties of sea ice deformation from buoy dispersion analysis, J. Geophys. Res.,113, C03002,

doi:10.1029/2007JC004143.

Kwok, R. (2006), Contrasts in sea ice deformation and production in the Arctic seasonal and perennial ice zones, J. Geophys. Res.,111, C11S22, doi:10.1029/2005JC003246

Kawaguchi, Y. and H. Mitsudera, (2008). A numerical study of ice-drift divergence by cyclonic wind with a Lagrangian ice model. Tellus A, 60:789{802, 2008. doi: 10.1111/j.1600-0870.2008.00321.x

Haapala, J., Lönnroth, N., and A. Stössel, (2005). A numerical study of open water formation in sea ice. J. Geophys.Res., 110, 2005. C09011, doi:10.1029/2003JC002200.

Heil, Petra, William D. Hibler, 2002: Modeling the High-Frequency Component of Arctic Sea Ice Drift and Deformation. J. Phys. Oceanogr., 32, 3039-3057.

Colony, R., and A. S. Thorndike (1984), An estimate of the mean field of Arctic sea ice motion, J. Geophys. Res.,89, 10, doi:10.1029/JC089iC06p10623

Minor points :

5. Title of the manuscript is rather general and it should reflect more on scientific focus of this work.

6. Vorticity values should be used consistently in same scale. Now, values are shown both in degree/18h and degree/h.

7. Table 3. Please, specify locations or spatial differences of buoys separately for May/Jun and Aug/Sep. It's important to know are changes of the Ui/Ug ratio solely due to the seasonal differences or could those be explained by the location changes. For example, if a single buoy drift from central Arctic to Fram Strait during a season, I guess that location change is more important than a seasonal change.

8. Table 4. What "Mean double amplitude of ice drift oscillation" indicate, do you mean "average increase of ice speed" ?

9. Figure 1 is unnecessary and can be removed.

10. The manuscript mostly reads well, but there are some expressions which are not suitable for a scientific publications, like "famous Norwegian vessel", "above-mentioned French vessel", "Canadian company", "French sailing vessel", "historically first cruise of a ship around the ice cap of the Arctic Ocean", "and so does our paper", "show many curves and circles" and "ice deck".

Interactive comment on The Cryosphere Discuss., 7, 3749, 2013.