

Interactive comment on “Variability of scaling time series in the sea ice drift dynamics in the Arctic Ocean” by A. Chmel et al.

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Dear Referee,

Please, see author’s reply below:

1. I suppose, this is a misunderstanding. The GPS accuracy is of a few meters. Please, see our discussion with Referee # 2.
2. The aerial sea ice survey in this region of Arctic Ocean is hardly available; in addition one should bear in mind that it must be performed just before and after a cycle of fragmentation. During a 5-years period of observations at the North Pole camps (2004-2009) we caught only two cases of the extensive sea-ice breakage in the vicinity of camps, which were simultaneously imaged from the space.

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3. Really, the resolution of the presented satellite images does not allow one to detect breakage of all individual ice floes. However in this context it makes no matter: we claim that the interaction of a particular ice floe with the environment has changed in the period of sea ice fragmentation imaged by the NOAA satellite. We suppose that these events are interconnected. Other interpretations are welcome.

At the same time, it is worthy to note that, as a rule, the fragmentation of large scale is extended down to individual ice floes. This was registered in the camps' logs (see also our response to Referee #1, item 1). The all-scale character of mechanical transformations in the ASIC was previously concluded from the buoys-assisted monitoring of sea ice deformations that promote fracturing [Marsan et al. Phys. Rev. Lett., 93, 178501 (1–4), 2004; Rampal et al. J. Geophys. Res., 113, C03002 (1-12), 2008].

4. Decomposing of the whole time series into independent periods is, of course, subjective and debatable. We identified several periods differing in the time-scaling properties and hypothesized several mechanisms that could govern the ice motion in these periods. Further studies and discussions could support or reject the suggested attributions. One of them (tidal activity) seems to be wrong: Referee #2 proposed a more convincing cause of the periodical oscillations in the last interval. We are thankful for his/her comments. Your remark on the possible contribution of tides is also of importance. In my opinion, the debates of this kind are a routine way to recognizing the significance of new facts.

Interactive comment on Ocean Sci. Discuss., 6, 1595, 2009.

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