**The Cryosphere
Discussions**

# *Interactive comment on* "Sea ice inertial oscillation magnitudes in the Arctic basin" *by* F. Gimbert et al.

**Anonymous Referee #1**

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General Comments:

This paper provides some measures of the strength of inertial oscillation in sea ice drift as a proxy for the degree to which the ice is in free drift or constrained by internal stresses. While generally well presented, there are a number of major and minor corrections that should be made.

Specific comments:

The magnitude of the inertial, oscillations presented here is the relative magnitude, that is relative to the magnitude of the mean drift speed. A loose pack could have both strong inertial oscillations and a strong mean drift, giving small M values. I recommend that the mean drift be removed from each "window" before the FFT is computed.

English usage is generally quite good, but an editor should be asked to review the manuscript. For example pluri-annual should be multi-annual throughout and there are other incorrect or awkward usages.

Strike "magnitude" from the title

Page 2184-8. What does "disconection" mean in this context?

2188-21: mention Kwok (2003) found significant oscillations in the same region, so it depends on when you look.

2190-4: The notation is very confusing here.

2191-2: Shouldn't Wcur be weighted by g(t) here and why have you switched to an integral instead of the summation used before?

2191-11: This discussion will be very different if you first remove the mean drift because then U=0.

2095-21: I see little similarity with the usual ice concentration maps.

2195-13: A minimum value for the sum( w i,j ) should be established. Some parts of the domain have very little data, sometimes far from the interpolation point.

2197-26: What is the motivation here? You are still weighting the latter years more heavily since there are more of your bins. Why not just get annual averages?

2199-21: The splitting of the time series in two seems very arbitrary. Perhaps it would be better to determine the maps of the trend and only plot points with sufficient data over the whole time period to compute the trend consistently, for example that there is a minimum number of points in the early 1980's. A simple evaluation of the uncertainty in the trend might be enough and only plot points with p-value of more than 90 or 95%. The trend could include all points within a radius of, say, 400 km of each lloacation. As it is, the uncertainty in the temporal sampling make it hard to interpret the maps.

2202-7: Again, the correspondence to ice concentration is weak.

2215: Over what region?

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