**Biogeosciences
Discussions**

Interactive comment on "Estimating absorption coefficients of colored dissolved organic matter (CDOM) using a semi-analytical algorithm for Southern Beaufort Sea (Canadian Arctic) waters: application to deriving concentrations of dissolved organic carbon from space" *by* A. Matsuoka et al.

Anonymous Referee #3

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General Comments: The authors propose using a modified semi-analytic algorithm to derive CDOM absorption at 443 nm for the Canadian Arctic waters. The semi-analytic algorithm is based on the GSM with initial categorization of the satellite remote sensing reflectance spectra according to their spectral shapes followed by the use of parameterizations (spectral slopes of CDOM absorption and of backscattering) that is dependent

on the selected reflectance spectral class. CDM (i.e. CDOM plus NAP) was partitioned into CDOM and NAP absorption contributions using the relationship between absorption by NAP and backscattering. Overall this is a sound approach and similar relationships between absorption by NAP and backscattering have been reported in studies conducted in the Gulf of Mexico. The CDOM absorption algorithm was combined with a DOC-CDOM relationship to derive a satellite DOC algorithm for the western Arctic waters. While the semi-analytic method and the combination of CDOM-DOC relationship for the satellite retrieval of DOC is promising, the study is limited by a small data set obtained in August of 2009. The authors have rightly pointed the need for further field observations, the challenge of estimating CDOM absorption in highly turbid waters and the potential effect sea ice melt contribution to DOC. The manuscript is well written, interesting and supported by good analysis and is recommended for publication in Biogeosciences. However the authors might address a few concerns listed below in the revised version:

Specific comments: 1) Figures 5a and 6a are too small and does not show well the spatial variability for August 2009. 2) The manuscript appears too focused as a methods paper. It would be interesting to show how CDOM and DOC distribution varies seasonally (spring to summer 2009) using the new semi-analytic algorithm and the CDOM-DOC relationship. 3) Minor edits: Page 13758, Line 25: replace "Atchlaflaya with "Atchafalaya"; Page 13759, Line 3, replace "Siverian" with Siberian".

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