How geostationary ocean color products could be applied to improve 3D physical-biogeochemical models of the open-ocean ?

Marina Lévy

How present ocean-color products are used ?

- Evaluation of model climatologies (annual, monthly)
- Assimilation of biogeochemical model parameters (at global or regional scale)
- Constrain on ocean circulation (at large-scale or mesoscale)

Use of 3D physical-biogeochemical models

- Understand the observed variability at different scales
    - Intra-seasonal (< 90 days)
    - seasonal
    - inter-annual (> 90 days)
    - decadal or longer
- Make projections for the future

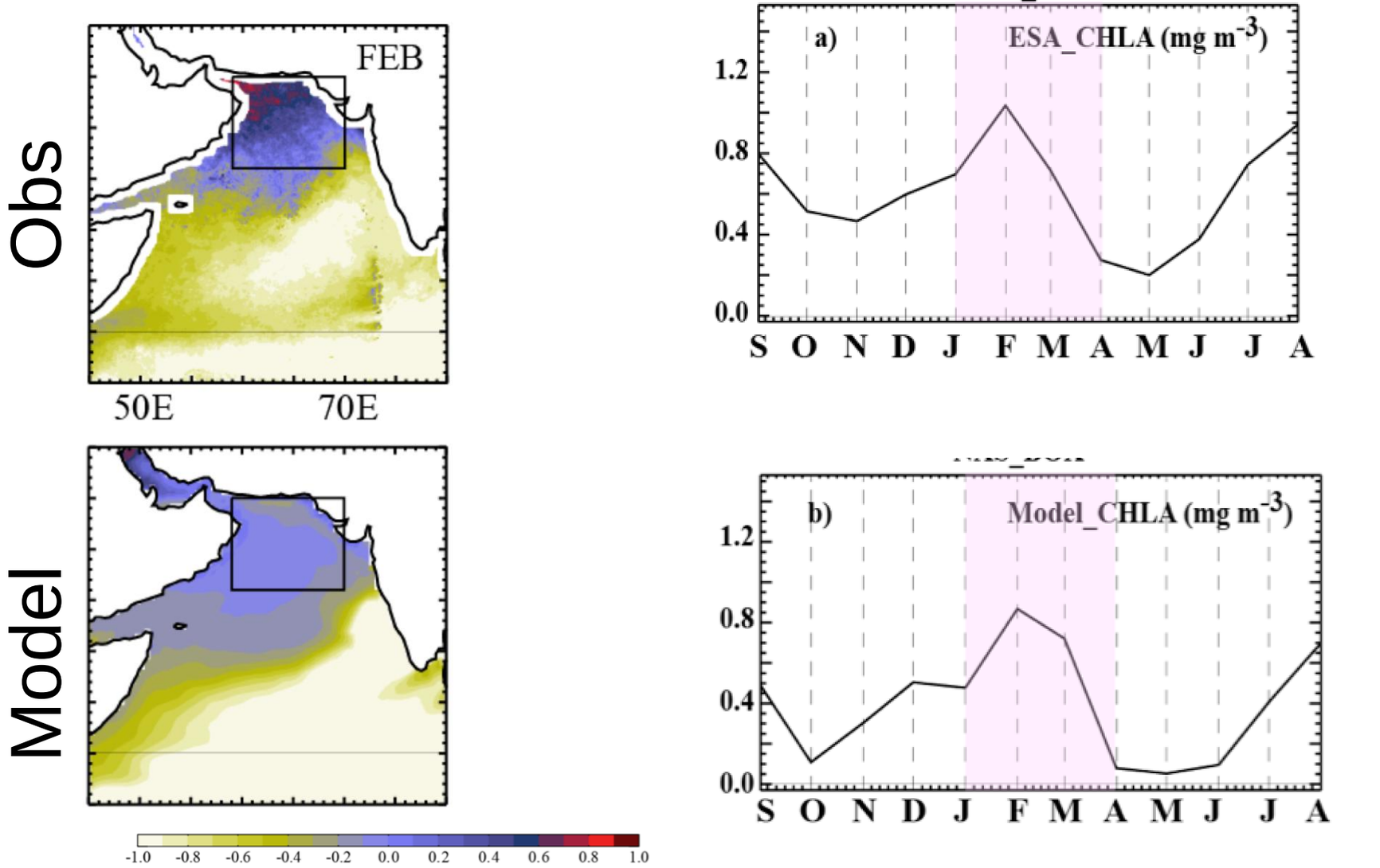
No diurnal cycle in models of the open-ocean but

- strong aliases in observations due to undersampling (clouds)

- submesoscale / intra-seasonal processes require observations at daily frequency

- undersampling makes it difficult to detect long-term trends

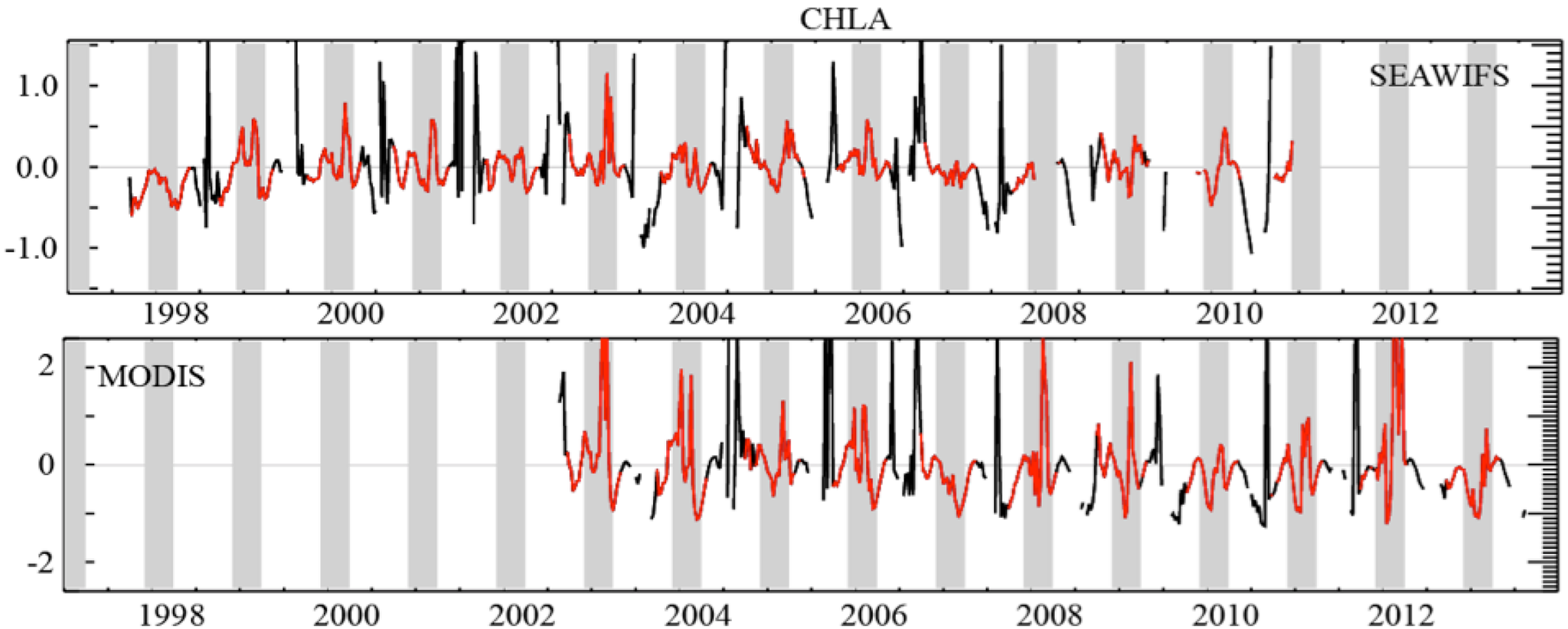
Intra-seasonal variability in the North Arabian Sea



Seasonal variability captured by the model

M. G. Keerthi, work in progress

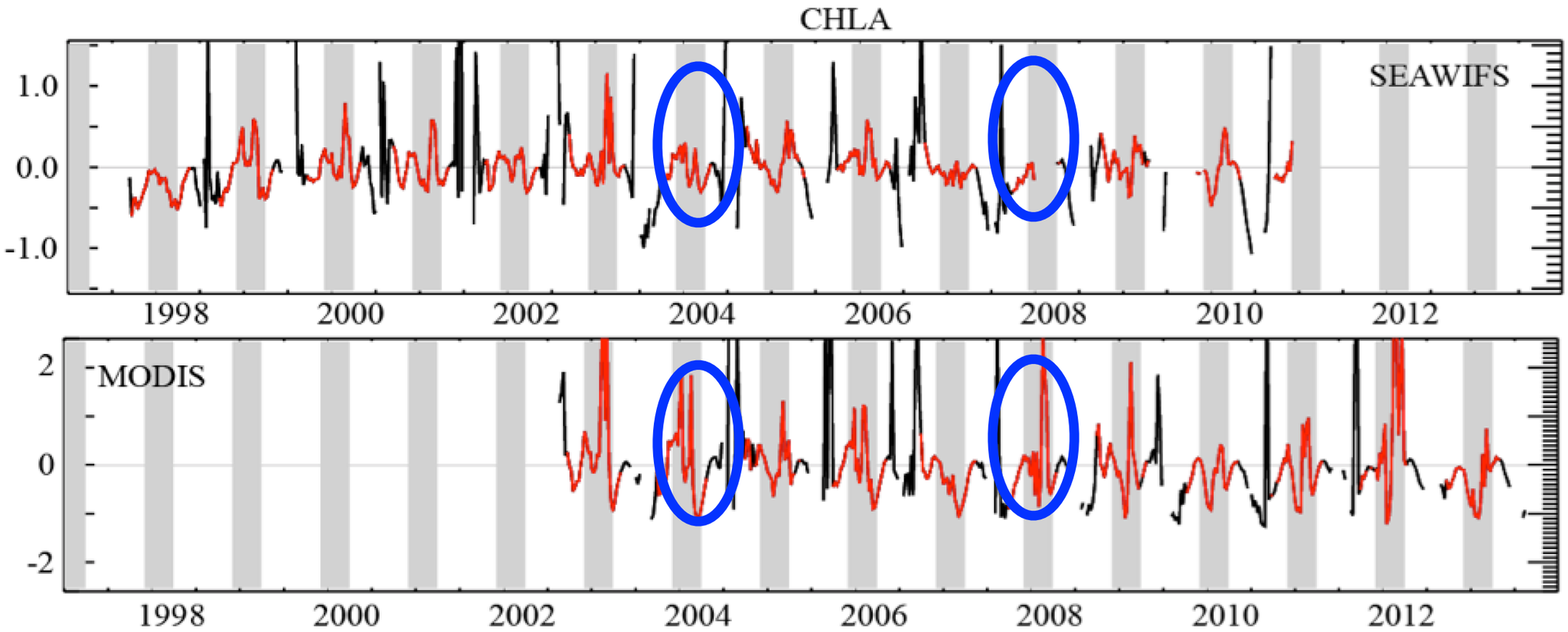
Intra-seasonal anomalies



More than 30% of missing pixels

Less than 30% of missing pixels

Intra-seasonal anomalies



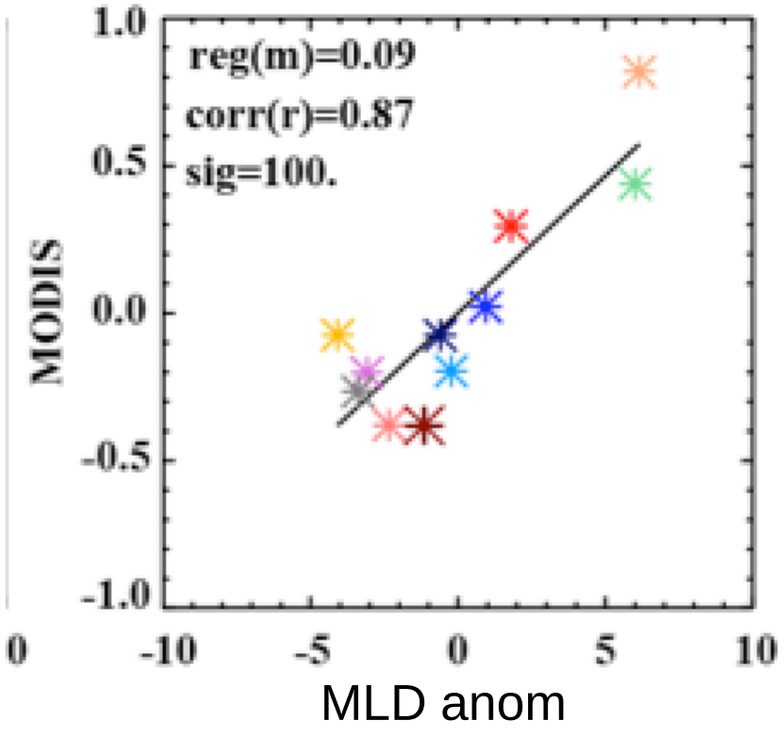
More than 30% of missing pixels

Less than 30% of missing pixels

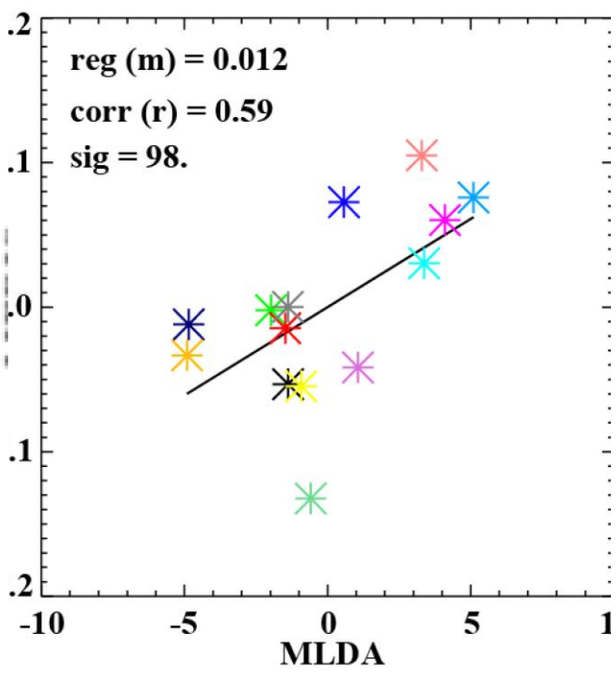
Model evaluation at intra-seasonal time-scale

The mechanisms driving intra-seasonal variations are well captured in Model A but not in Model B

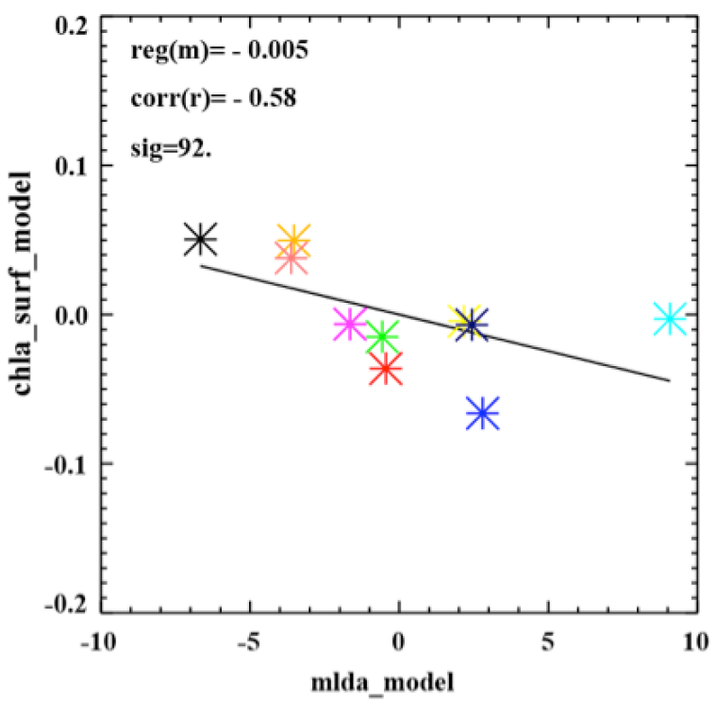
MODIS



Model A



Model B



Take home message

- Geostationary images should give access to daily effective resolution

- Will help improving model variability at intra-seasonal and inter-annual time scales