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.
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