Diurnal Cycle: Issues

- Daytime Solar Heating Stratifies
- Night Time Convection Mixes
- Rectification $\Rightarrow$ 0.25°C warmer SST
- Demands on model convection / wind mixing
- Diurnal cycle vertical penetration non-linear
- Observations of regimes
- Verify/guide LES
Mean Diurnal Warming

\[ T_{\text{skin}} (14:00h) - T_{\text{skin}} (\text{Night}) \]
Mean Diurnal Warming (AMSR-E)
- Distribution of dSST observed by SEVIRI at 2 pm LT
- Stratified by AMSRE (~1.30 pm) wind speed
- Amplitude determined by SSI(t), Qnon-solar(t) and U(t)
SST Coupling Coefficient, $C_{sst}$

Ice free range

-20 $\rightarrow$ -70 W/m²/ °C
Surface Flux Issues

• Verification of satellite radiation estimates.
• Cal/Val for satellite precipitation
• Cal/Val of satellite BGC (Carbon, Color)
• Departures from “mean Transfer Coefficients” (eg. Wind-wave conditions)
• Parameterize latent and sensible heat in terms of skin or bulk SST?
• Bulk versus more direct turbulent fluxes (CO₂)
IV.2 : Surface radiation

\[ \langle f_{ocnQ_S} \rangle = 165 \, \text{W/m}^2 \]

\[ \langle f_{ocnQ_L} \rangle = -53 \, \text{W/m}^2 \]
IV.2: Turbulent heat fluxes

\[ <f_{\text{ocn}Q_H}> = -14 \text{ W/m}^2 \]

\[ <f_{\text{ocn}Q_E}> = -96 \text{ W/m}^2 \]
IV.2: Net heat flux @ 20 W/m² intervals
Freshwater fluxes

\[ R \approx <f_{\text{ocn}} F_{\text{as}} > = -3.6 \text{ mg/m}^2/\text{s} \]

\[ <f_{\text{ocn}} P > = -34.9 \text{ mg/m}^2/\text{s} \]

\[ <f_{\text{ocn}} E > = -38.4 \text{ mg/m}^2/\text{s} \]

Contoured @ 10 mg/m²/s