Project DE-SC0021341

Cloud-atmosphere impacts on the Central Arctic surface energy budget: First results from MOSAiC

Multidisciplinary drifting Observatory for the Study of Arctic Climate

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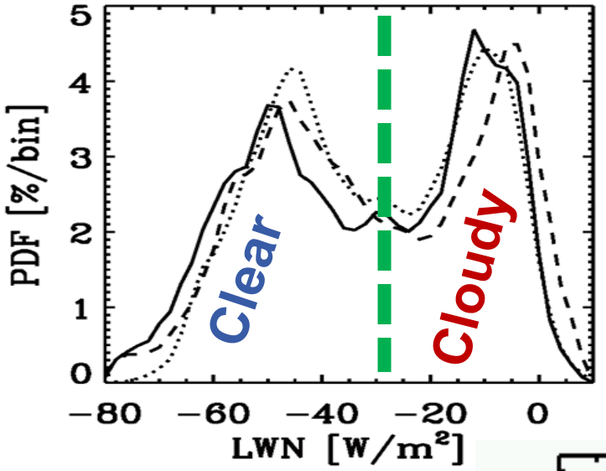
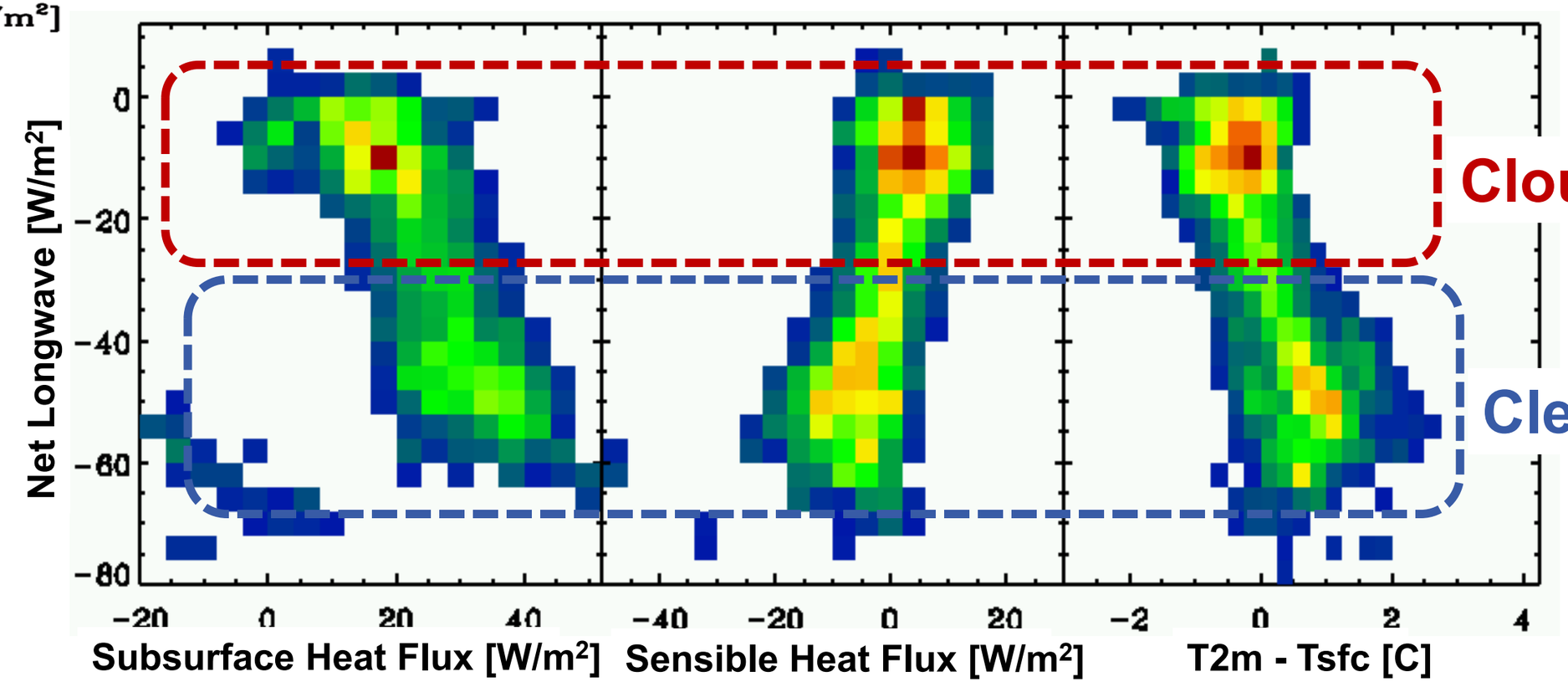
Project Goals

- Characterize annual cycle of SEB
- Seasonal cloud effects on partitioning
- Developing a general conceptual model
- Assessment of model representations

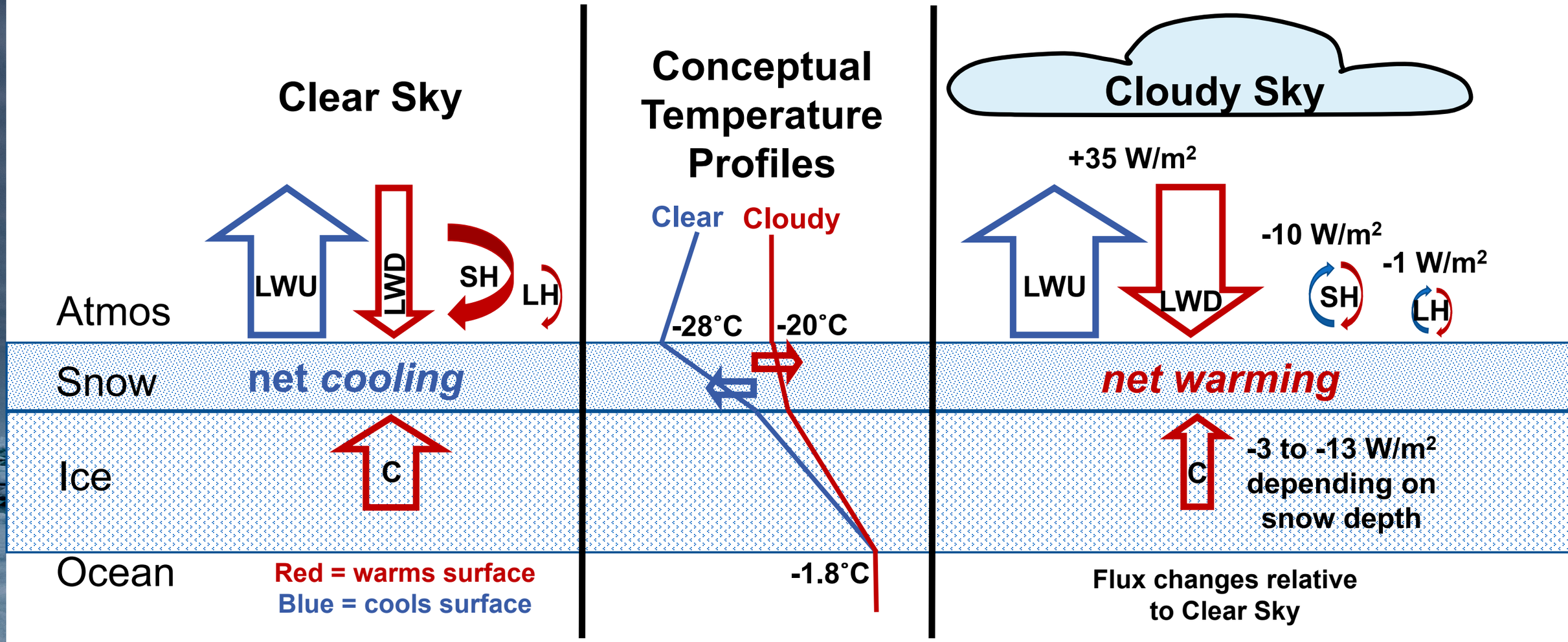
Process Relationships - Winter



- Winter surface radiative states are similar to elsewhere in Arctic: bi-modal based on presence or absence of supercooled liquid water
- Subsurface conductive flux, sensible heat flux, near surface temperature gradient, and other terms respond to these states
- These relationships offer insight into the overall balance of surface energy terms in response to atmospheric forcing



Conceptual View for Winter Sea Ice



- Radiative cooling
- Turbulent, conductive warming
- Snow and ice cooling
- Cold surface, stable atmosphere

- Less radiative cooling
- Less turbulent, conductive warming
- Snow and ice warming
- Warm surface, neutral atmosphere