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Sea ice thickness - albedo feedback loop inferred from satellite retrieved snow/ice interface temperature

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Rapid decline of the Arctic sea ice has been important global warming issues. These changes are thought to be mainly linked to warming near the surface. If the surface warms, then the sea ice below the snow layer will also be warmer, possibly influencing sea ice melt in the following seasons. However, due to a lack of observations, how much the ice has been warmed during the global warming era, or how ice warming influences further ice me lt still remains unknown. Here we report that, based on satellite observations, there has been an unprecedented warming of wintertime sea ice over recent 30 years (1988–2017). The top ice layer over the Central Arctichas been rapidly warmed, with a rate of up to 9.3C over 30 years, which is much faster than the surface warming rate of up to 5C. This is found to be largely due to thinning sea ice. Being consistent, we also found that the Arctic sea ice thickness has been decreased by about 40% in the same 30-year period. The gradually warmer and thinner sea ice found in the winter should help the ice melt earlier, enhancing the ice albedo feedback, and thus melt more ice in following melting seasons. In turn, due to increased summer melt, more of thinner and warmer sea ice should be expected in winter, establishing a positive feedback loop between the summer and winter.

School of Urban & Environmental Engineering

- **When : 2019.12.04. (Wed) 14:00**
- **Where: Bldg.110 (EB4), Room.1007**
- **Host : Prof. Lee, Myong-In**
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