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## Autonomously observing coupled Arctic processes year-round: the Distributed Network of ice-tethered buoys during MOSAiC

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The Arctic Ocean is a region with unique physical processes coupling the atmosphere, sea-ice and ocean. Biogeochemical and ecosystem processes feedback with this physical system not only on a regional scale but also locally around each ice floe. Capturing these processes, both vertically and horizontally from the mesoscale to turbulence scales is essential to understand the Arctic system and to improve model simulations of this region and global climate.□

The MOSAiC Distributed Network (DN) of autonomous, ice-tethered measurement systems recorded a full seasonal cycle of atmospheric, surface, sea ice and snow, and oceanic conditions. Physical and biological variables were measured throughout the whole drift of the original MOSAiC ice floe with the icebreaker Polarstern (Central Observatory, CO) from north of Laptev Sea to Fram Strait, covering the seasons from mid-autumn 2019 to mid-summer 2020. In addition, a subset of ice-tethered buoys observed the freeze-up in the central Arctic around the second CO, after the relocation of the ice camp in late summer 2020, and even beyond the drift of Polarstern. These observations form a variety of three-dimensional datasets valuable for analyses across the spectrum of research foci covered by MOSAiC.

We will present the scientific concept of the DN in the context of other MOSAiC observations, and show the success and preliminary scientific results from a whole year of autonomous observations.□

**Team MOSAiC Distributed Network:** MOSAiC Team ATMOS, MOSAiC Team ICE, MOSAiC Team OCEAN, MOSAiC Team ECO, MOSAiC Team BGC, Distributed Network deployment team