Friday, October 12
Oral Session 12
14:00–15:20

14:20–14:40

RESOLVING COASTAL OCEAN PARTICLE CHARACTERISTICS AND DYNAMICS USING A STATIONARY UNDERWATER IMAGING SYSTEM

Marine aggregates of biogenic origin, known as marine snow, are considered to play an important role in the oceans particle flux. These aggregates are the major vector for the transfer of carbon from the upper ocean to deeper layers and a potential food source for zooplankton. However, our mechanistic understanding of the processes controlling the biological carbon pump is limited by a lack of observational data at appropriate scales. This is especially true for coastal and marginal seas, which play a key role in the global carbon cycle by linking the terrestrial, oceanic, and atmospheric carbon reservoirs, but are still to a large extent ignored in global carbon budgets. We here present results from a novel underwater observatory which has been recently deployed in the North Sea. The cabled underwater observatory combines a remote-controlled underwater camera and an Acoustic Doppler Current Profiler allowing continuous and automatic small-scale observations of marine aggregates and zooplankton in near real-time covering temporal scales from seconds to several months. We present zooplankton and particle small-scale distribution patterns and provide indirect evidence of copepods feeding on marine snow aggregates. Furthermore, we observed differences in sinking speeds and utilization by zooplankton due to the origin and size of marine snow and linkages of primary production as observed by remote sensing to particle concentrations in the water column. Our observations highlight the significance of aggregates in marine ecosystems and provide new insights into particle dynamics to better understand and quantify the variability of the oceans biological carbon pump.

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