

Kaffeklubben

1. December Tuesday
@ 13:00 LY202-Room 8003
and on Zoom
<https://dtudk.zoom.us/j/63718001331>



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**Bacteria and viruses at extreme oceanic depths (8000-10000 m):
Spatial variations and evidence of prophage-encoded genes
supporting bacterial growth in hadal sediments**

Abstract:

Hadal trenches represent the deepest part of the global ocean, and are dynamic depocenters with intensified prokaryotic activity. Here we explored the distribution and drivers of prokaryotic and viral abundance in Kermadec (10000 m) and Atacama (8000 m) trenches. In the abyssal sediments (~6000 m) above the trenches, prokaryotic and virus abundances were lower than at the hadal sites and declined exponentially with sediment depth, closely tracking the attenuation of total organic carbon availability. In contrast, the hadal sediments exhibited erratic depth profiles of prokaryotes and viruses with many subsurface peaks. The prokaryotic abundance correlated with extensive fluctuations in organic carbon content at centimeter scale, which were likely caused by recurring mass wasting events, resulting in a high spatial heterogeneity in virus and prokaryotic abundances in hadal sediments. Further, analysis of a virus-*Pseudomonas* sp system isolated from Kermadec trench sediments demonstrated a prophage-encoded chitinase gene, which supported host growth in the presence of chitin. Overall, the results suggest that viruses play an important role for prokaryotic mortality and carbon cycling in deep trench sediments with fluctuating inputs of organic material.