

# Colloquium Talk

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## The importance of wave-current interactions in operational oceanography

Wednesday, March 7, 2018

at 15:40 h

ESI, Boltzmann Lecture Hall

**Abstract:** The purpose of ocean circulation models in an operational setting is typically to provide support for oil spill mitigation, search-and-rescue, ship routing, offshore operations, and so on. Focus is therefore primarily on the dynamics of the upper ocean. Surface waves play an important role with regard to turbulent mixing and modification of upper ocean drift velocities through wave-current interactions. The latter is particularly important, and the wave-induced component of the drift of oil spills or other bouyant materials is often dominant. Furthermore, since the waves influence the air-sea fluxes of momentum and energy, the upper ocean response to transient atmospheric forcing is tightly coupled to the waves, and this coupling must be taken into account in the forecasting systems in order to correctly model the currents in the Ekman layer. We still lack observations to validate several aspects of wave-current interaction theory, but some progress has been made using autonomous instrument platforms and in dedicated campaigns where a wide range of sensors have been deployed. I will show some examples from the field, and also examples from modeling studies of oceanic drift in which wave effects have been taken into account. I will also comment on a few outstanding challenges from both an observational and modeling perspective.

A. Constantin

February 26, 2018