"Nonlinear theory of atmospheric gravity waves"

Mark Schlutow, FU Berlin

Abstract:
Atmospheric gravity waves play a significant role in numerical weather prediction. Especially, waves with rather short wavelengths, which appear regularly and influence predictions, remain spatially unresolved by the numerical simulations, such that they need to be parametrized, i.e. represented somehow by resolved quantities. In order to improve weather forecasting, my work aims to enhance gravity wave parametrizations by focusing on nonlinear waves. Nonlinear wave dynamics may lead to counterintuitive properties that are not available in linear theory. For instance, the group velocity, as defined usually by the derivative of the dispersion relation, may not coincide with the wave's actual envelope velocity.