1123-86-11 **Ian G Grooms*** (ian.grooms@colorado.edu). *A Gaussian-product stochastic Gent-McWilliams parameterization.*

The locally-averaged horizontal buoyancy flux by mesoscale eddies is computed from eddy-resolving QG simulations of ocean-mesoscale eddy dynamics. This flux has a very non-Gaussian distribution peaked at zero, not at the mean value. This non-Gaussian flux distribution arises because the flux is a product of zero-mean random variables: the eddy velocity and buoyancy.

A framework for stochastic Gent-McWilliams (GM) parameterization based around stochastic parameterization of the horizontal subgrid-scale density flux is presented. Within this context Gaussian random field models for subgrid-scale velocity and buoyancy are developed; these models are used to construct a stochastic horizontal subgrid-scale density flux as the core of a non-Gaussian stochastic GM parameterization. This new non-Gaussian stochastic GM parameterization is tested in an idealized box ocean model, and compared to a Gaussian approach that simply multiplies the deterministic GM parameterization by a Gaussian random field. The non-Gaussian approach has a significant impact on both the mean and variability of the simulations, more so than the Gaussian approach. Future directions for development of the stochastic GM parameterization and extensions of the Gaussian-product approach are discussed. (Received July 11, 2016)