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An experimental and theoretical investigation of internal wave generation in the presence of a turning depth ALLISON LEE, JULIE CROCKETT, Brigham Young Univ - Provo — Internal waves generated from the M2 semidiurnal tide flowing over oceanic bathymetry have an important effect on the global energy budget. However, in some regions of the deep ocean the natural frequency (N) falls below this tidal frequency and only rapidly decaying vertical, evanescent, waves are generated. If these evanescent waves reach a depth where N is greater than the tidal frequency, a turning depth, they can become propagating internal waves. To explore the potential influence of this form of internal wave generation on overall ocean energy budgets, we performed experiments to investigate how propagating internal wave kinetic energy from evanescent waves is affected by the local stratification profile, topography shape and distance between the topography and turning depth. An analytical model using linear theory was also developed to estimate the kinetic energy transfer from the evanescent to propagating region. The analysis compares well with experimental results. The results show that the kinetic energy of propagating internal waves increases as the average natural frequency increases and as the distance between the topography and the turning depth decreases. These trends are dependent on topography shape; as the slope of the topography increases, the kinetic energy decreases.

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