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Enhanced vertical mixing by grass shrimp (Palaemenets) in a linearly stratified fluid CLAUDIA CENEDESE, Woods Hole Oceanographic Institution, COLM-CILLE P. CAULFIELD, BPI & DAMTP, U. of Cambridge, WILLIAM K. DEWAR, Florida State University, PETER H. WIEBE, NANCY COPLEY, Woods Hole Oceanographic Institution — Laboratory experiments investigated the vertical mixing generated by grass shrimp (Palaemenets) in a linearly stratified tank (50x50x70 cm). The linear stratification ($N = 0.19$ s^{-1}) becomes homogeneous in approximately two days, much faster than if only molecular diffusion was at play. The density evolution in time agrees well with the solution of the diffusion equation for values of enhanced k_s (2.0 10^{-2}cm^2/s when 100 shrimp are present and $k_s = 1.0\ 10^{-2}$cm^2/s with 50 shrimp) when compared to the molecular diffusivity of salt $k_s = 1.3\ 10^{-5}$ cm^2/s. Hence, the laboratory experiments suggest that the enhanced vertical mixing generated by the presence of grass shrimp in a linearly stratified ambient fluid has a diffusive behavior with a diffusivity enhanced by 3 orders of magnitude when compared to the molecular diffusivity of salt.

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