

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Generation of a jet by a sphere descending in stratified fluids

HIDESHI HANAZAKI, HIROYASU YOSHIKAWA, TOHRU OKAMURA, Kyoto University — Flow around a sphere descending vertically at constant speeds in uniformly stratified fluids is investigated by numerical simulations. As observed in recent salt-stratified tank experiments for strongly stratified fluids at high Schmidt number, vertical thin round jets and “bell-shaped” structures along the jets were observed in the lee of the sphere. The bell-shaped structure was found to be the consequence of steady internal waves in the lee of the obstacle, and it was actually generated where the downward velocity was the maximum. Temporal density variation on the rear stagnation point of the sphere and on the vertical symmetry axis of the flow in the lee of the sphere give some hints on the generation mechanisms of the jet, including the significant effects of molecular diffusion of salt.

Hideshi Hanazaki
Kyoto University

Date submitted: 09 Aug 2010

Electronic form version 1.4