Numerical simulation of jets generated by a sphere moving vertically in stratified fluids HIDESHI HANAZAKI, SHOTA NAKAMURA, Kyoto University — Numerical studies are performed on the flow past a sphere moving vertically at constant speeds in a stratified fluid. Initial unsteady development of the flow shows that violation of density conservation due to diffusive effects on the sphere surface is the key process for the generation of jets observed in the experiments, since the fluid which was originally at dragged downward would indefinitely long distance unless the isopycnal surface is not teared off. Initially, when the diffusion is negligible, the density is conserved so that the density contours are simply pulled down by the sphere. As the diffusion becomes larger, fluid of unconserved density generates a jet. The violation of density conservation on the sphere surface occurs first near the equator of the sphere where the diffusion is large, and the diffusion becomes larger poleward to finally become effective at the rear/upper stagnation point.

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