Generalisation of Stokes problem

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We study generation of infinitesimal periodic motion in an unbounded, incompressible, isothermal, viscous fluid by an friction oscillating on a sloping plane taking into account diffusivity effects. The problem is extended the classical Stokes' problem. A set of dispersion equation roots contains terms corresponding to internal waves and additional roots describing three types of periodic boundary layers. The first one is a viscous boundary layer and has an analogue in a homogeneous fluid that is a periodic or Stokes' flow. The two other are specific features of stratified flows. Not all solutions are regularly matched between themselves in limiting cases. The spatial decay of the singular components depends on the viscosity, diffusion and stratification. Calculated parameters of periodic 3D internal wave beams are able to fit the best recent experimental data exquisitely well. Extrapolation on the environment is discussed.