

Abstract Submitted
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Interaction of the 2D vortex patch with the wall. Eruption of the boundary layer phenomenon. ZIEMOWIT MALECHA, Wroclaw Univ of Technology — The boundary layer eruption phenomenon caused by a 2D patch of vorticity moving above a wall was investigated. It was shown that eruption phenomenon depends on the viscosity (or Reynolds number, Re) of the fluid. There exists a threshold value of Re above which the eruption takes place. The initiation of the eruption goes through the creation of a small recirculation zone near the solid wall. For small Re numbers it disappears but for larger it is strongly stretched in the direction perpendicular to the wall. The terminal state is appearance of a saddle point on streamlines inside the recirculation zone. Next this zone is torn off and portion of the fluid particles from the near wall region are abruptly ejected into the other flow. Further increase of the Reynolds number causes more complex flow. One can observe that eruption is regenerative and that the vortex patch can produce a cascade of secondary vortices. The vortex-in-cell method was employed to investigate the eruption phenomenon.

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