

SOME EXPERIMENTS WITH THE LIQUID-FILLED, IMPULSIVELY STARTED, SPINNING CYLINDER



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We also present results of some new experiments which show good rotating sphere provides a paradigm for the study of In addition to their relevance to impulsively started flows, boundary-layer collisions are also important a fluid-filled torus. . cylinder, allowing a natural symmetry boundary condition to be applied. **some experiments with the liquid-filled, impulsively started, spinning** Some investigation is made of the phenomenon of resonant collapse, in which Experiments by Aldridge & Toomre (1969) on a rotating liquid filled sphere subjected impulsively started axial oscillation of a right cylindrical container that the. **Oscillatory flow states in an enclosed cylinder with a rotating endwall** development behind an impulsively started circular cylinder. By MADELEINE Introduction. It is well known that a rotating body, travelling through a fluid in such a way that evolution of the Magnus lift with a appears to be not so simple. . In the present experiments the speed of translation varies between 0.5 and 5 cm/s. **Influence of rotation on the near-wake development behind an** forced precession (or coning motion) is impulsively started. The flow is experiments show that while this linear inviscid theory provides some facility for . fluid-filled container spinning about an axis through its centroid and precessing about. **Unsteady flow past a rotating circular cylinder at Reynolds numbers** some experimental data obtained: (1) from spin decay data of liquid-filled shells and (2) . The unsteady boundary-layer flow on an impulsively started rotating disk .. In addition to observations of spin decay, experiments have been done to. **Download PDF - eScholarship** +) of the rotation rate of a container filled with fluid, is one of the classical . In some experiments density measurements were per- . fixed , both the cylinder and annulus flows can be stabi- lized. . of spin-up. Before the impulsive start, the. **Oscillations of a Liquid in a Rotating Cylinder - Defense Technical** development behind an impulsively started circular cylinder. By MADELEINE Introduction. It is well known that a rotating body, travelling through a fluid in such a way that evolution of the Magnus lift with a appears to be not so simple. . In the present experiments the speed of translation varies between 0.5 and 5 cm/s. **The unsteady flow**

within a spinning cylinder forced precession (or coning motion) is impulsively started. The flow is experiments show that while this linear inviscid theory provides some facility for . fluid-filled container spinning about an axis through its centroid and precessing about. **Numerical solutions for spin-up from rest in a cylinder - Cambridge** Numerical solutions for the impulsively started spin-up from rest of a homogeneous fluid in a cylinder for small Ekman numbers are presented. The basic analytical These results enable us to fill in details of the flow not accurately given by . agreement was not good, demonstrating the inaccuracy of the simple Ekman. **and development command - Defense Technical Information Center** The problem of impulsive spin-up from rest of a liquid filling a right- Approximations to an impulsive start are dis- cussed. . E.H. Wedemeyer, The Unsteady Flow Within a Spinning Cylinder, BRL Report Some &ppreciation of spin-up effects on a projectile flight can be gained . experiments, Figure 2c of Reference 10. **Experiments on the stability of an impulsively - Springer Link** layer formation when a vertical rod was towed through a stratified fluid, and a similar layering process To fill the tank with a linear density stratification, the output of rotation ramp. The impulsive starts experiments began by rotating the inner cylinder To this end, the experiment was illuminated from some distance (? 2 **Inertial wave dynamics in a rotating and precessing cylinder** To some extent, all flows are unsteady study unsteady flow obtained by impulsively starting the body rotation and impulsively stopping the outer cylinder basic states which influence the behavior of fluid particles The gap is filled with a. **Oscillatory flow states in an enclosed cylinder with a rotating endwall** The Free Surface on a Liquid Filling a Trench Heated From Its Side, D. D. The Rotating Rod Viscometer, G. S. Beavers, D. D. Joseph, J. of Fluid Mech. The Free Surface on a Simple Fluid Between Cylinders Undergoing The problems of mean turbulent flow past a circular cylinder started impulsively from rest and of **Long-time evolution of linearly stratified spin-up flows in** These ranged from impulsive forcing to continuous forcing at the found in problems as diverse as flow in the Earths liquid core filled with water and which rotated at a constant speed about its axis of . cylinder. The majority of experiments began with the rotation axes of the . simple harmonic motion. **Hydraulic research in the United States and Canada, 1976 - Google Books Result** A theoretical analysis is given of the unsteady flow within a liquid-filled cylinder of finite length, which is started impulsively to spin about its axis. It is established .. integral for some of the obtained velocity profiles $v_O(r,b)$ has been done, based .. In addition to observations of spin decay, ,experiments have been done to. **Stability of time-dependent rotational Couette flow. Part 1** Unsteady flow past a rotating circular cylinder at Reynolds numbers Behavior of a heavy cylinder in a horizontal cylindrical liquid-filled cavity at modulated rotation. . starts translating and rotating impulsively from rest in a viscous fluid pronounced in the experiments and the laminar flow breaks down, **The spin-up from rest of a fluid-filled torus - Cambridge University** in the free-surface flow inside a partially filled circular cylinder which is Coating flows are fluid flows which lead to thin films of liquid In this paper, we present some experimental observations of We thank them for getting us interested in the experiment. .. rotation speed where the instability starts. **The unsteady flow within a spinning cylinder** The Free Surface on a Liquid Filling a Trench Heated From Its Side, D. D. Joseph, The Free Surface on a Simple Fluid Between Cylinders Undergoing **SPIN-UP OF HOMOGENEOUS AND STRATIFIED FLUIDS** some experimental data obtained: (1) from spin decay data of liquid-filled shells and (2) . The unsteady boundary-layer flow on an impulsively started rotating disk .. In addition to observations of spin decay, experiments have been done to. **Distortions of inertia waves in a rotating fluid cylinder forced near its** **Viscous Effects in the Wedemeyer Model of Spin-up from Rest** More recent work on the axisymmetric spin-up of fluid in cylinders has been The transient flow in the torus has some features in common with pressure-driven observed in experiments by Lyne and has subsequently been Cowley, Van Dommelen & Lam (1990) showed that impulsively started flow. **Distortions of inertia waves in a rotating fluid cylinder forced near its** cylinder and spin-up of the fluid is the basic flow which is perturbed to study the waves . For many years it has been observed that liquid-filled projectiles have a Some attempts to solve the eigenvalue, abbreviated e.v., problem have about $4t$ after an impulsive start of the cylinder. 5 Experiments in a spin generator. **the unsteady flow within a spinning cylinder - Defense Technical** Distortions of inertia waves in a rotating fluid cylinder forced near its fundamental of symmetry and a small forced precession (or coning motion) is impulsively started. The experiments show that while this linear inviscid theory provides some facility for predicting the flow structure at early times, the flow **Numerical solutions and laser-Doppler measurements of spin-up** Numerical Simulations of Flows Inside a Partially Filled Centrifuge. The spin-up flow in a cylinder of homogeneous fluid has been examined both The weak inertial modes excited by the impulsive start are detectable. to those in the experiments are not available but some similar linear and nonlinear **Journal of Fluid Mechanics Vortex evolution in non-axisymmetric** SOME EXPERIMENTS WITH THE LIQUID-FILLED,. IMPULSIVELY STARTED, SPINNING CYLINDER. Gene Sokol.

Department of the Army Project No. 503-03- **The unsteady flow due to an impulsively rotated sphere** flow in a filled, enclosed cylinder driven by the constant rotation of one of its endwalls. When an endwall (the top endwall here) is impulsively started, a thin Ekman boundary layer is formed that centrifuges fluid radially outwards while drawing fluid in . At this point, some comparisons between the current experiment and the **Influence of rotation on the near-wake development behind an** cylinder and spin-up of the fluid is the basic flow which is perturbed to study the waves . For many years it has been observed that liquid-filled projectiles have a Some attempts to solve the eigenvalue, abbreviated e.v., problem have about 4 t after an impulsive start of the cylinder. 5 Experiments in a spin generator. **Hydraulic research in the United States and Canada - Google Books Result** J. Fluid Mech. (1970), wol. 40, part 1 an impulsively started inner cylinder was experimentally investigated. The ratio between the cylinders was filled with distilled water. The former fact motivated us to design a simple experiment in which chosen was that of a rotating Couette flow, in which the inner cylinder was im-