



## **Exact solution for a creeping flow and some applications to the sedimentary basins**

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Study of the flow at low Reynolds number is the base for the investigation fluid movement in porous media [1]. Recent experiments [2, 3] detect that gas or vapor bubbles in the vicinity of the small gap could arise at low Reynolds number. Some conditions including the minimal gap size and the amount of the dissolved air in the fluid could lead to exceeding the tensile strength and the violation of the fluid continuity. A small air (or vapor) bubble arises in the area where negative pressure is in the solution without bubble. As consequences of the bubble rise the pressure becomes not negative and additional force appears. It is investigated the flow between two moving and rotating cylinders. Considered problem is the generalization of the problem exactly solved by Joukovskii and Chaplygin [4] more than a century ago. It is obtained exact solution just as the classical one but with complex number coefficients instead of real ones [5]. The obtained solution leads to some suggestions concerning the flow in porous media with deformable matrix which is typical for the sedimentary basins and hydrate accumulation and release.

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