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Flow Field Investigations in Centrifugal Pumps with Simple Blade Curvature and Constant Impeller Width by Means of Digital Particle Image Velocimetry

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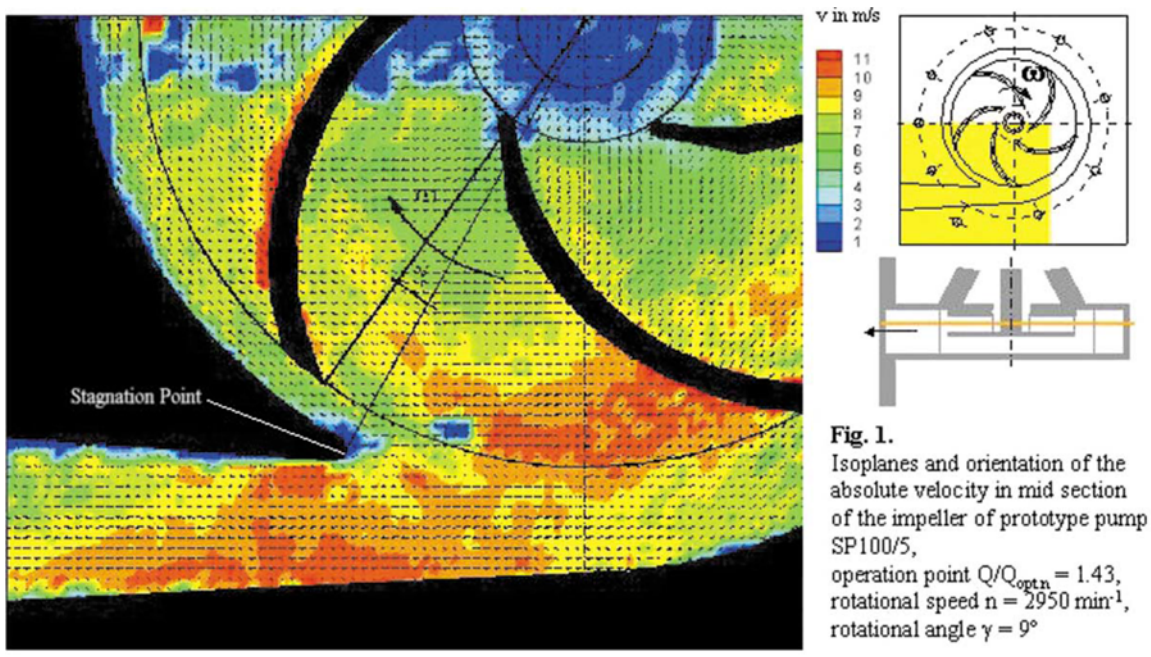

Fig. 1.
Isoplanes and orientation of the absolute velocity in mid section of the impeller of prototype pump SP100/5,
operation point $Q/Q_{opt\,n} = 1.43$,
rotational speed $n = 2950\ min^{-1}$,
rotational angle $\gamma = 9°$

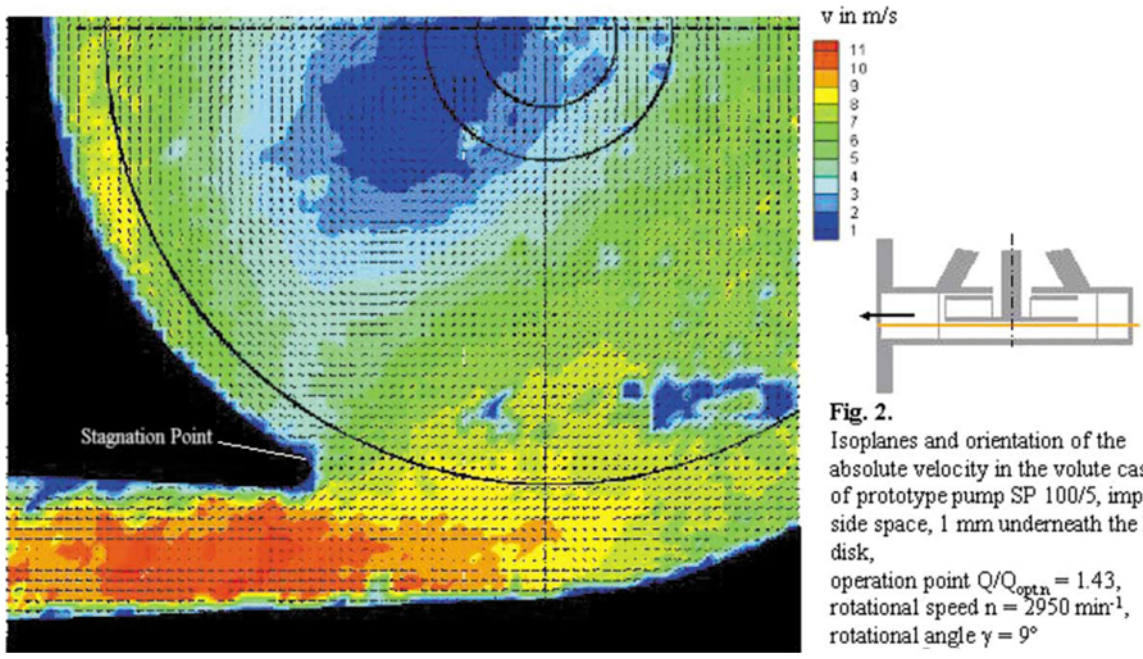

Fig. 2.
Isoplanes and orientation of the absolute velocity in the volute casing of prototype pump SP 100/5, impeller side space, 1 mm underneath the hub disk,
operation point $Q/Q_{opt\,n} = 1.43$,
rotational speed $n = 2950\ min^{-1}$,
rotational angle $\gamma = 9°$

Centrifugal pumps for photovoltaic pumping systems are applied in a wide operating range around their best efficiency point. This leads to different flow fields inside the pump, producing e.g. variations of the position of the stagnation point at the tongue. Moreover, at the same operating point, the flow field in different sections of the pump varies strongly. For increasing the pump efficiency, investigations of the flow inside the impeller and volute casing by means of digital particle image velocimetry are performed.