

From the Renaissance to Turbulence – A modern Look at Da Vinci’s Impinging Jet Flow

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Abstract

In Leonardo Da Vinci’s body of work, its genius is also expressed in his water flows drawings. In Da Vinci drawings, different fluid flow phenomena were illustrated e.g.: the impinging jet and the flow around obstacles. Aiming at obtaining more quantitative information about the drawings of Da Vinci an experimental setup was built at the Institute of Hydro-Engineering of the Polish Academy of Sciences to reproduce the impinging jet in a basin and measure it with modern measurement techniques such as imaging techniques with high-speed cameras. Although there is no quantitative data regarding Da Vinci’s drawings, several educated guesses were made to estimate a range of flows and dimensions. Using imaging techniques, it was possible to characterize the dimensions and range of the jet for different flow rates, and by means of Particle Tracking Velocimetry, it was possible to characterize the induced velocity field in the stilling basin. These measurements have practical application since the impinging jet flow is currently used in cases such as: jet energy dissipation, fluid mixing, flow aeration, and turbulence studies.