

# Effect of porous media on the flow and heat transfer during thermal energy storage: Visualization study

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## ABSTRACT:

We are interested in this work by the influence of the porous on the internal flow structure induced by an isothermal and heated jet as well as the mechanisms of heat transfer in rigid grains used for storing the heat.

The experiment consists of a parietal plan water jet entering through the top of a tank and exiting by the bottom of the opposite side.

At first, the jet is considered isothermal and we study the effect of the porous media on reducing the recirculation zones.

In a second time, the jet is heated and heat storage in the grain will do.

During this storage, we investigate the mechanism of transfer between the fluid and the porous structure and its influence on the stratification.

These experiments were conducted in a Plexiglas tank at different temperatures and low flow rates.

Visualizations were ensured by P.I.V shadowgraph techniques. Direct measurement of temperature were also performed.

**Key words:** Internal flow, Porous media, energy storage, visualization, heat exchange