

# Numerical Investigation of Flow Dynamic in Mini- Channel: Case of a Mini Diode Tesla

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**Abstract:** Microfluidic systems are used and exploited in various fields, as they are highly specific and developed in their use. The micro devices are used in various analyzes of medical disciplines, chemical and other fields. Our research team "MAAt" within ENERGARID laboratory is in the process of triggered several lines of research in this area, the micro-mixing, separation of micro particles, droplet production. For that, we need tools and micro devices to study the phenomena.. In this work, we present a theoretical study and numerical simulation of micro device (micro diode Tesla). A Diode Tesla is similar to a heart valve conduit profile is shown in the following figure: In this simulation work, we will focus the variation of geometrical parameters, the inside length  $lw$  ( $lw_1 > lw_2 > lw_3$ ), this study aims to optimize this setting to get a better efficiency. Then we will investigate the effect of the pressure variation on the volume flow.

**Keywords :** Mini channel, diode Tesla, Efficiency, gas flow, microsystem.