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Water atomization in spray nozzles



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Spray nozzles are an important feature of many industrial applications. The traditional way to treat spray is to use Lagrangian particles with a suitable injector modeling in the CFD-simulations.

STAR-CCM+ does provide a model (Pressure Swirl Atomiser and LISA-model) for the primary atomization that allows the user to set several spray parameters such as cone angles and mass flows. However, this method is only applicable to a pressure swirl spray nozzle. If a different spray nozzle is to be used a method that relies on experimental data has to be used, e.g. knowledge of the velocity and droplet distribution has to be known in order to implement the spray in STAR-CCM+.

In order to reduce the need of experimental data a methodology for investigating the primary atomization has been developed using STAR-CCM+. The method provides data such as velocity and angles for a simulated mass flow in a given geometry. This data may subsequently be used as input data for any of the Lagrangian injectors that are provided within STAR-CCM+.

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