

ASIPS- Lite

Advanced Spray Injection Phenomena Simulator



- **Jet-in-crossflow liquid column & spray models**
 - spatially resolved
 - time-averaged
- **Spray properties output**
 - drop diameter
 - liquid phase velocity
 - liquid volume flux
 - gaseous fuel mass flux
- **Fast calculation times**
 - 10 – 100 min per case
 - “batch” mode to run multiple cases at in serial
- **Simple User Interface**
 - single executable file
 - text input file
 - program requires only physical properties & operating condition

Contact Info

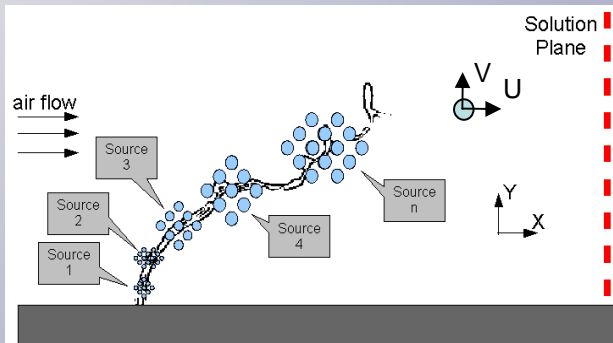
Energy Research Consultants
23342 South Pointe Dr. Suite E
Laguna Hills, CA 92653

949.583.1197 *101
web@erc-ltd.com



Model Overview

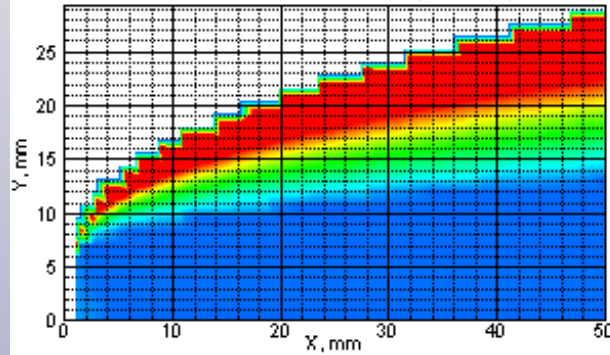
Asips-Lite models the breakup and evolution of liquid jet in crossflow fuel injectors. The program first models the development and breakup of the liquid column. It then uses the liquid column answers to initialize a drop transport model that proceeds to a user defines solution plane



Input

- Liquid Properties
 - density
 - viscosity
 - surface tension
- Gas Properties
 - density
 - viscosity
- Experimental Condition
 - orifice diameter
 - air velocity
 - liquid velocity at orifice

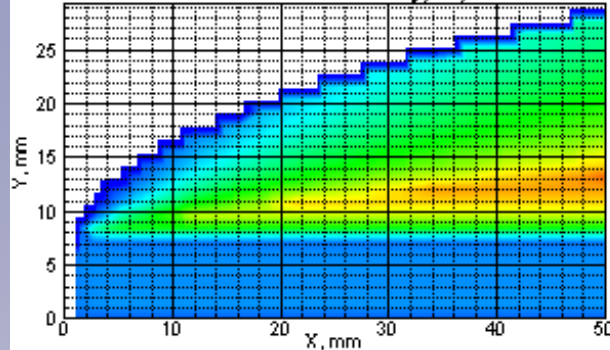
Sauter Mean Diameter, SMD, μm



Liquid Column

Using the operating conditions at the orifice exit, ASIPS-Lite predicts the liquid column trajectory, mass stripped, drop initial properties, and column breakup for user controlled time steps from orifice exit to predicted breakup time. These values are then used to define initial conditions for the drop transport model

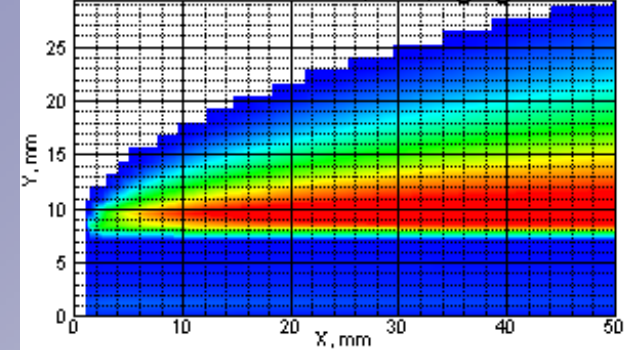
Streamwise Velocity, U , m/s



Drop Transport

The drops shed from the liquid column are modeled as they accelerate and evaporate downstream. Drops are binned by location and the drop properties are averaged at each bin.

Fuel-Air Ratio, F/A , kg/kg



Output

- Liquid Properties
 - position & velocity
 - diameter
 - mass loss
- Spray Properties
 - penetration
 - Saunter mean diameter
 - mean velocity
 - liquid fuel flux
 - vapor fuel flux