

Cross sections library automatic generation for neutronic and diffusion codes. Uncertainty and sensitivity analysis in thermal-hydraulic and neutronic codes.

Carles Mesado

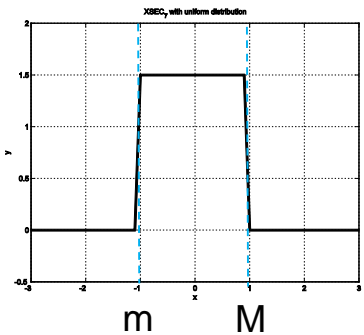
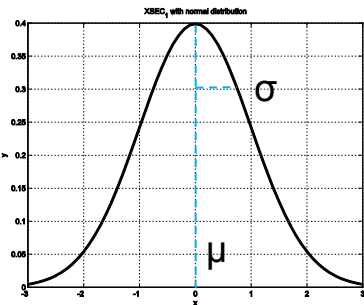
I Encuentro de Estudiantes de Doctorado

ISIRYM

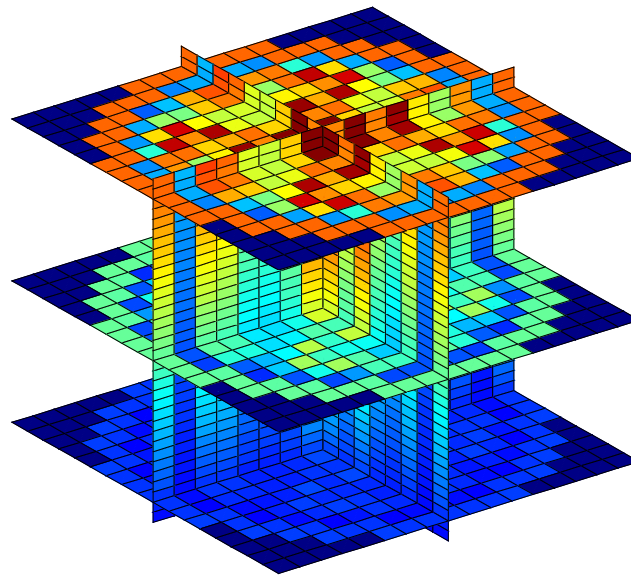


Objective: nuclear security analysis in LWR

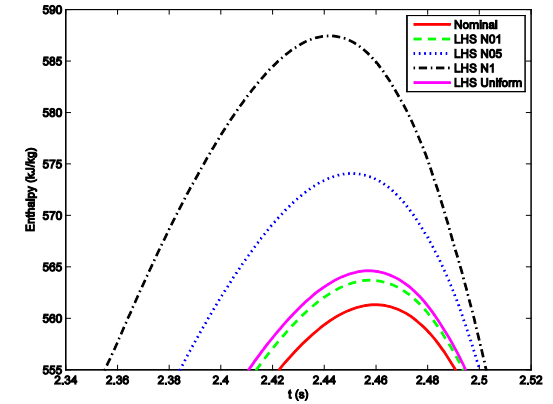
Inlet parameters



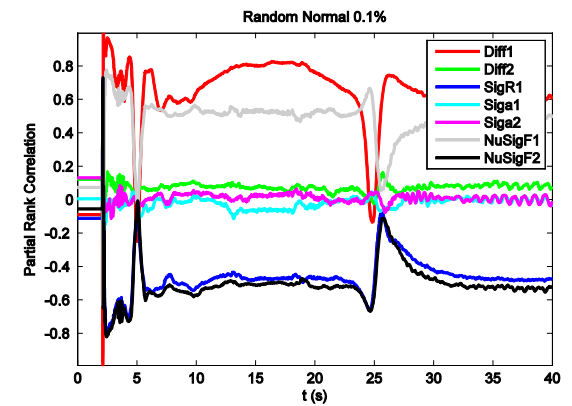
TRACE/PARCS



Outlet parameters



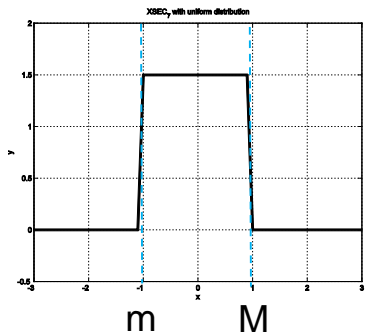
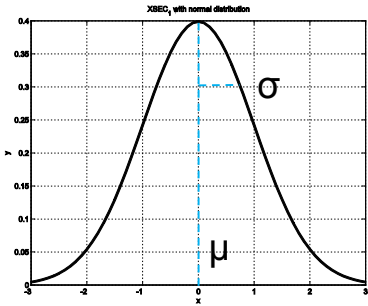
Uncertainty



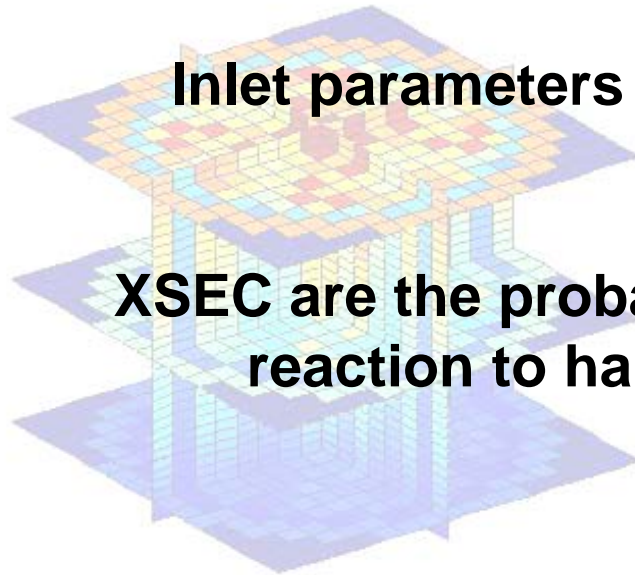
Sensitivity

ISIRYM

Inlet parameters



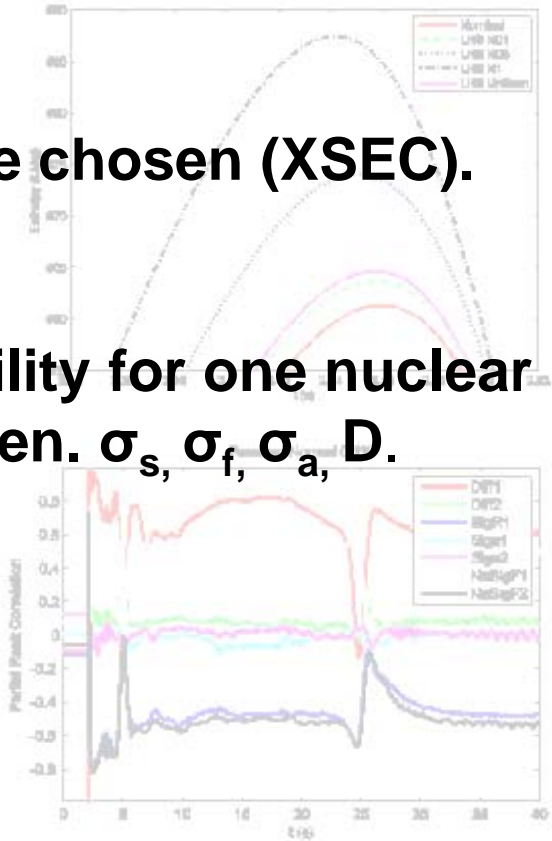
TRACE/PARCS



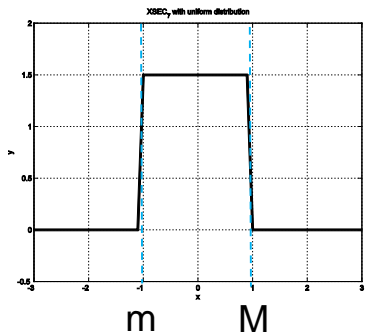
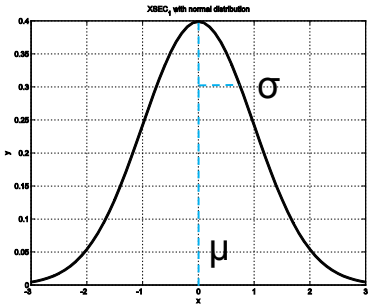
Inlet parameters are chosen (XSEC).

XSEC are the probability for one nuclear reaction to happen. σ_s , σ_f , σ_a , D .

Outlet parameters



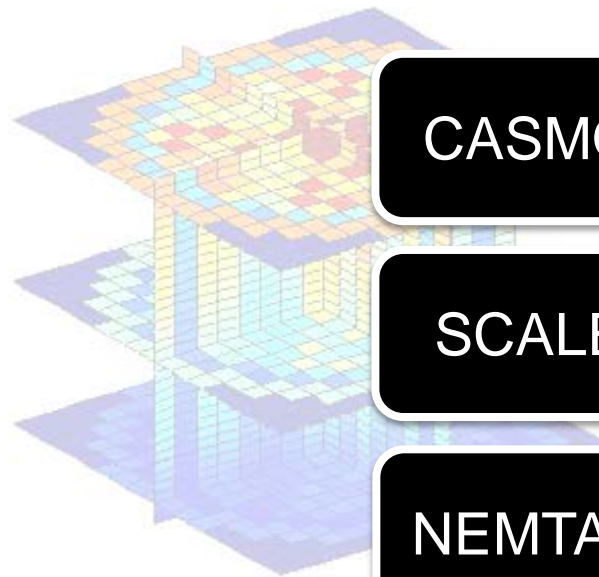
Inlet parameters



TRACE/PARCS

Outlet parameters

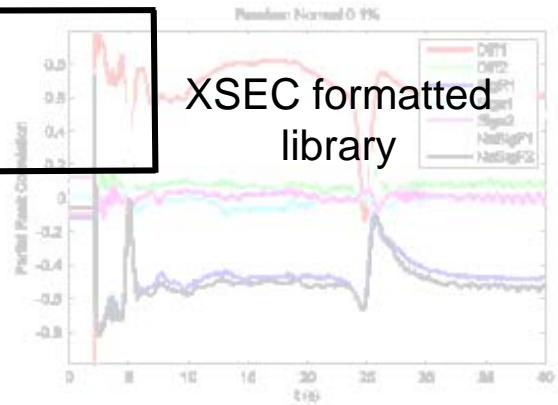
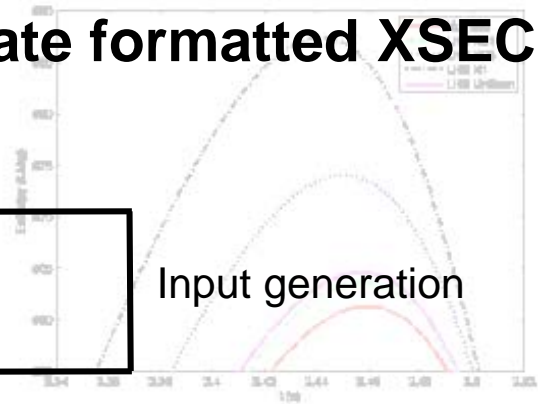
MATLAB code to generate formatted XSEC.



CASMO

SCALE

NEMTAB



Uncertainty

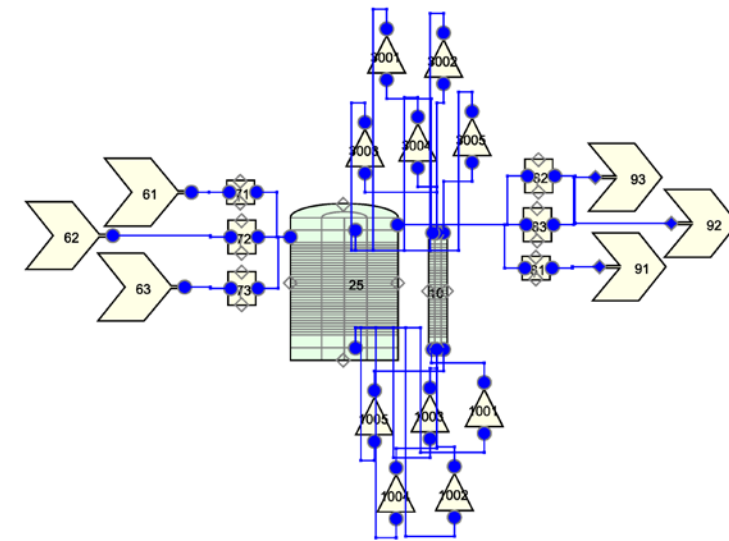
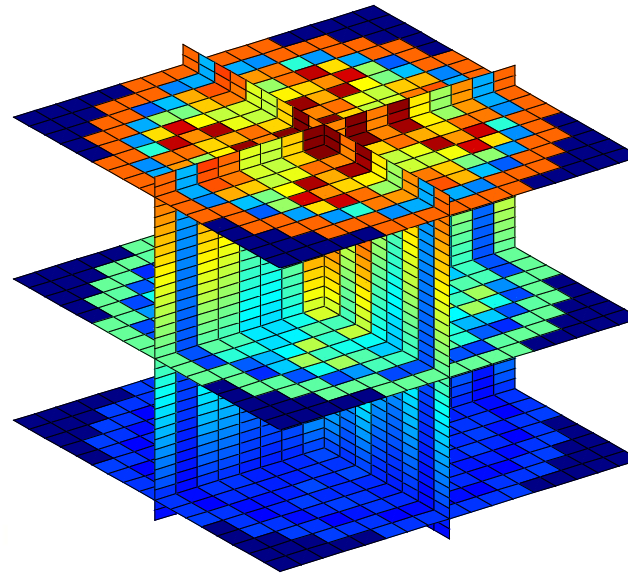
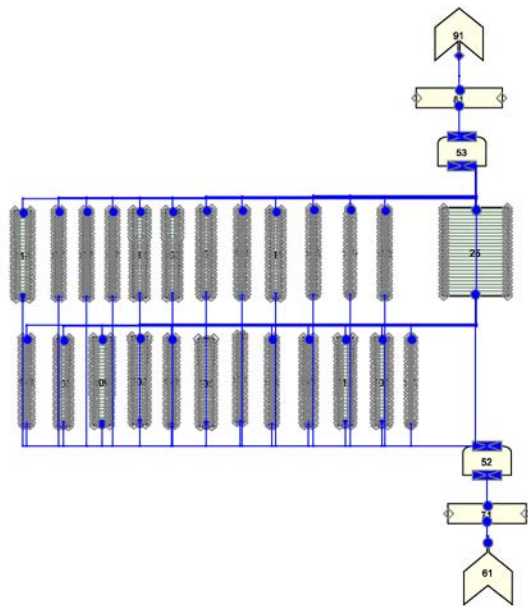
Sensitivity



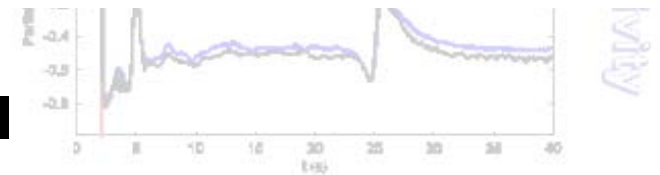
Inlet parameters
1D model

TRACE/PARCS

Outlet parameters
3D model

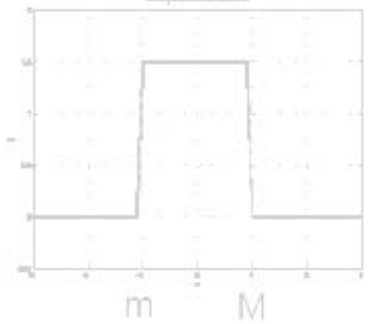
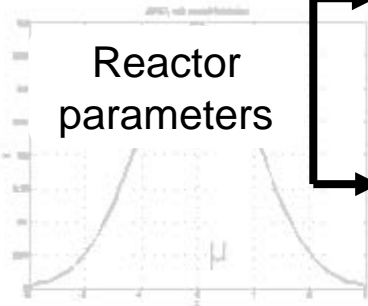


Thermal-hydraulic model



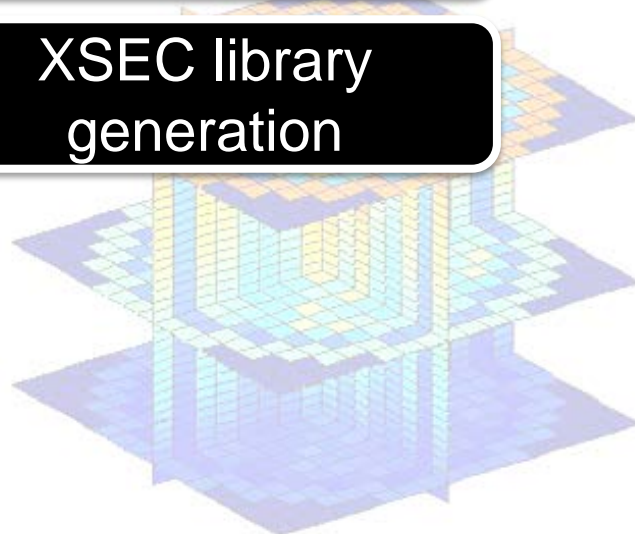
ISIRYM

Inlet parameters

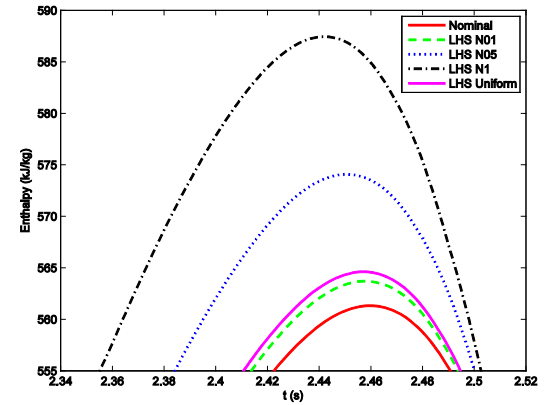


TRACE input generation

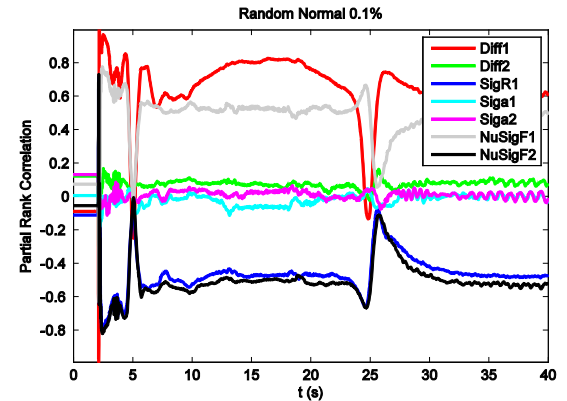
XSEC library generation



Outlet parameters



Uncertainty

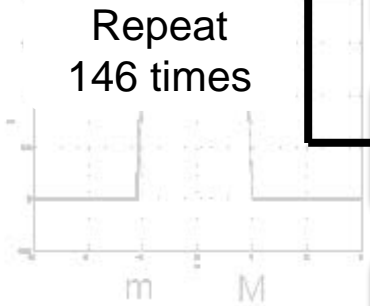
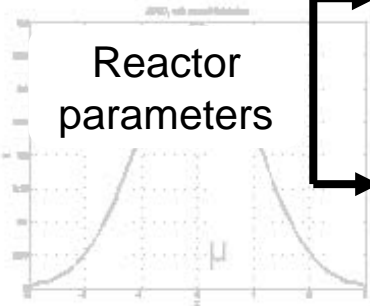


Sensitivity

ISIRYM



Inlet parameters



TRACE input generation

XSEC library generation

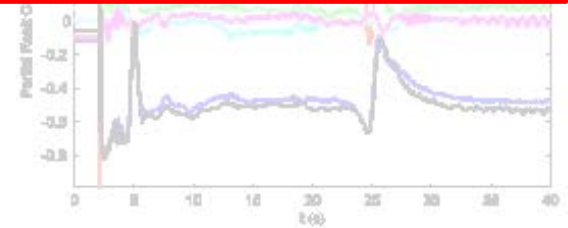
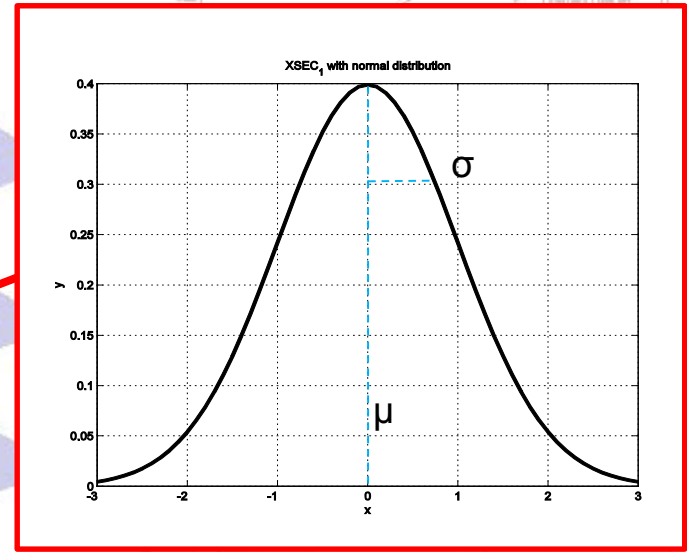
XSEC = XSEC.pert(μ, σ)

TRACE/PARCS simulation

DAKOTA: U&S

Outlet parameters

DAKOTA sampling

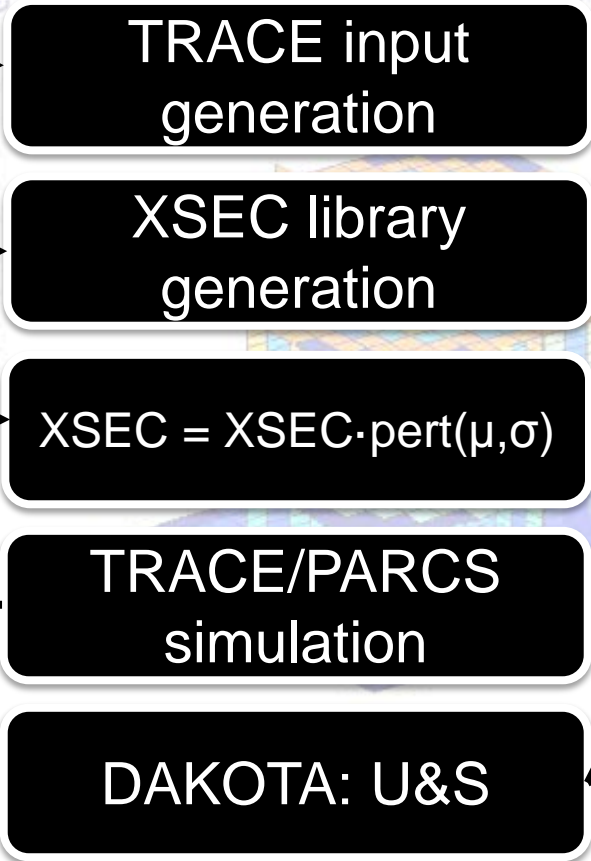
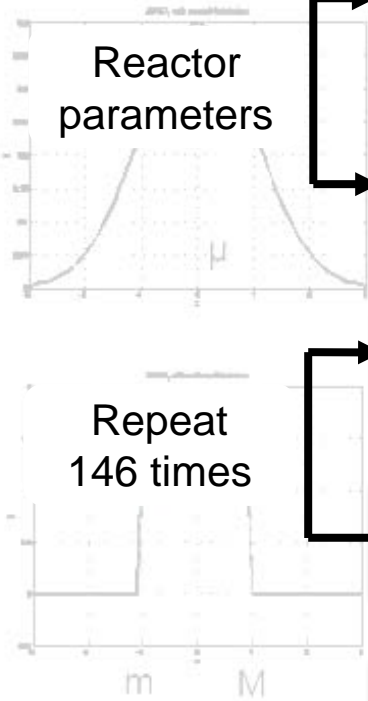


Uncertainty

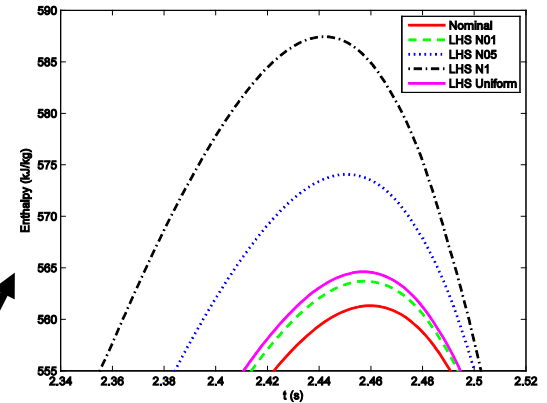
Sensitivity



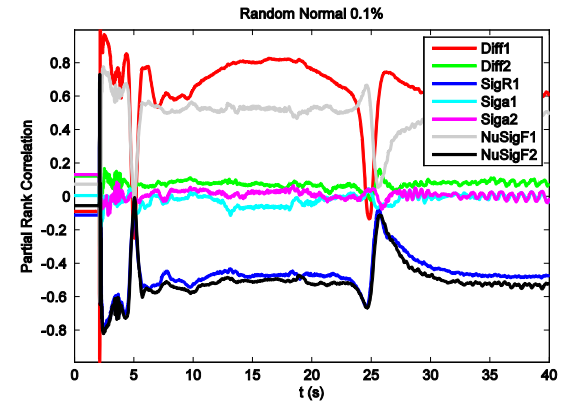
Inlet parameters



Outlet parameters



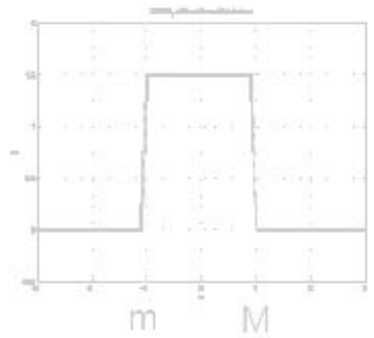
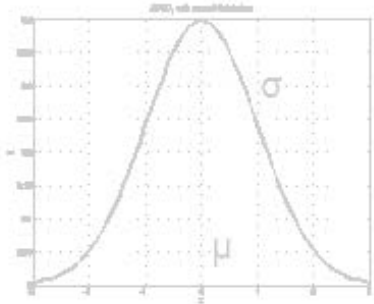
Uncertainty



Sensitivity

ISIRYM

Inlet parameters

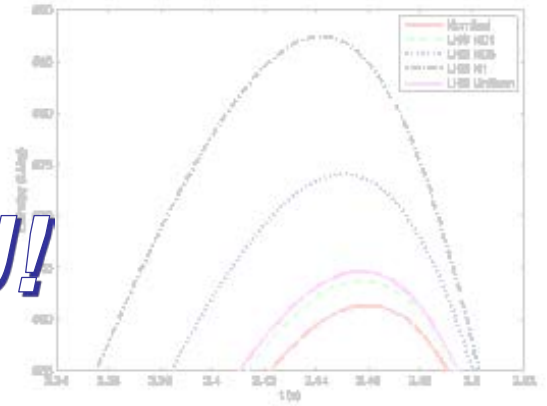


TRACE/PARCS

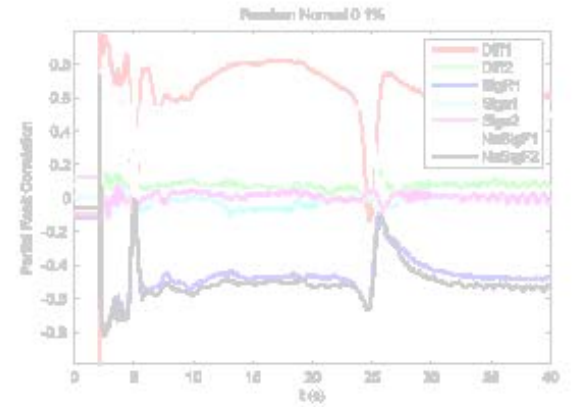


THANK YOU!

Outlet parameters



Uncertainty



Sensitivity

