Pipeline: Transport Codes

Workshop for Applied Nuclear Data Activities 2020

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Teresa Bailey
Lawrence Livermore National Laboratory

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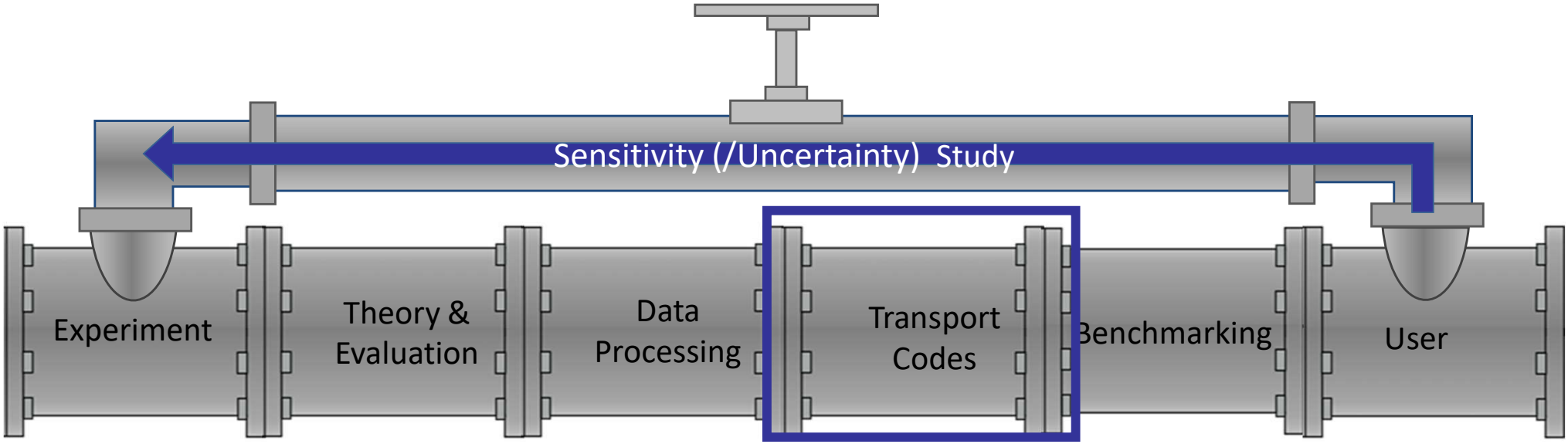
Transport Codes



Transport codes are the computational engine used to model engineering systems

- Transport codes – numerically evolve the solution to the linear Boltzmann Transport Equation
  - Deterministic (S_N, P_N) and Stochastic Methods (Monte Carlo) methods
  - Calculations tend to be relatively expensive, driving codes to HPC and emerging architectures
- Transport code developers:
  - Often the first customer of nuclear data
  - Often develop a strong interest in nuclear data
  - Develop a deep understanding about need for high quality data
- SQA and V&V are key elements to production transport code development
- Transport codes are driven by need to port to emerging architectures
- National Labs and multiple Universities are engaged in ongoing transport R&D

We are discussing transport code development in much more detail at the Scattering, Transport, and Shielding Roadmapping Session

Transport codes are the computational engine used to drive nuclear physics/engineering UQ

- Transport codes are used in UQ studies to calculate metrics of interest (e.g. keff)
- UQ studies are wide ranging, requiring different types of transport solutions
  - Adjoint solutions
  - keff, detector response, time dependent solutions, etc
- Transport codes must be V&V'ed, efficient, and robust in order to meet the demands of ongoing UQ studies
- Each application area has its own set of transport code requirements for UQ studies

Basic UQ Study