CFD Methodology

Physics	Grid	Numerics	Solution	Analysis
Problem Statement	Geometry	Discretization Method	Algorithm Development	V&V
Governing Equations	Structure	Accuracy	Steady or Transient	Postprocessing & Visualization
Physical Models	Special Requirements	Implicit or Explicit	Simulation Execution	Interpretation of Results
Assumptions & Simplifications			Convergence	

Model Verification and Validation Process

reality of interest

modeling

confirmation

— modeling activities

‑ ‑ ‑ assessment activities

mathematical model

simulation outcomes

validation

software implementation

computer model
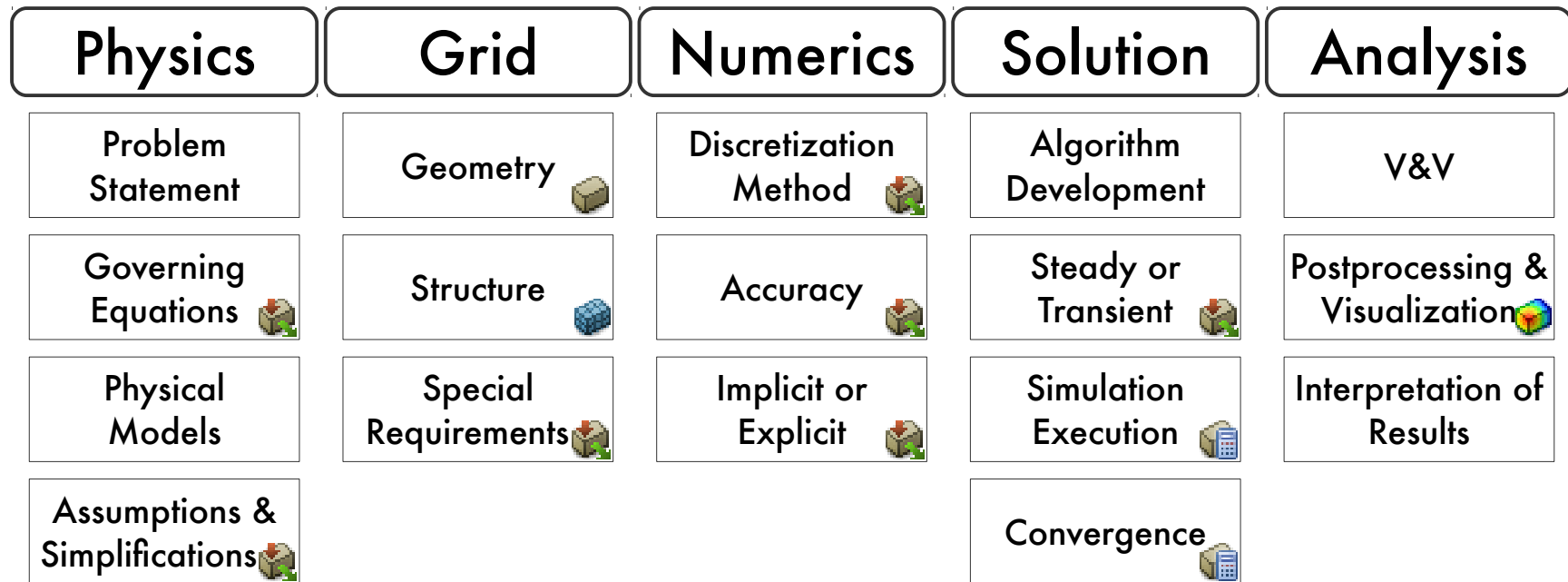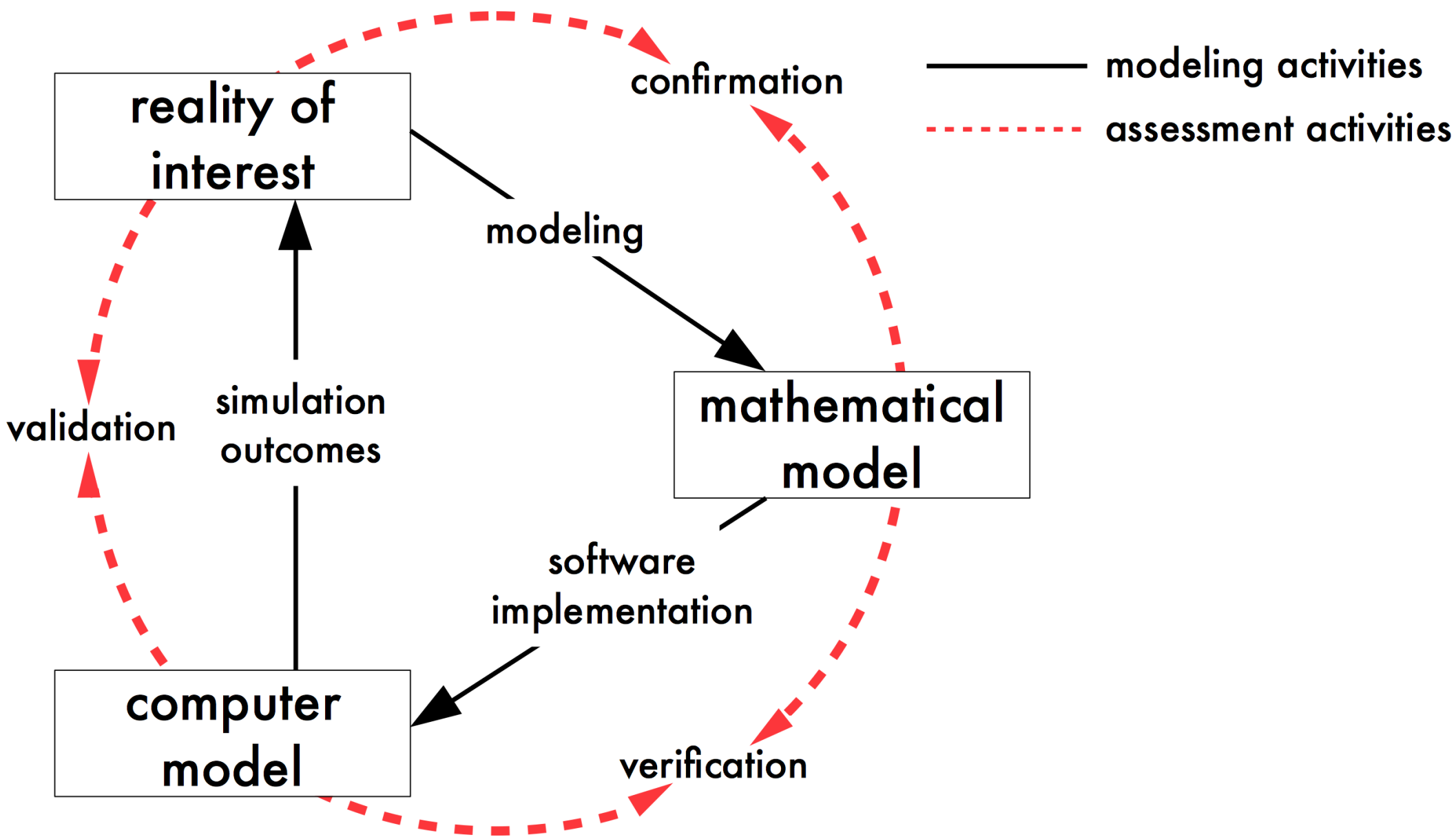
verification

Adapted from graphic in *Concepts of Model Verification and Validation*, LA-14167-MS, p. 5.

Validation Assessment Process

1. Examine Iterative Convergence.

2. Examine Consistency.

3. Examine Spatial (Grid) Convergence.

4. Examine Temporal Convergence.

5. Compare CFD Results to Experimental Data.

6. Examine Model Uncertainties.