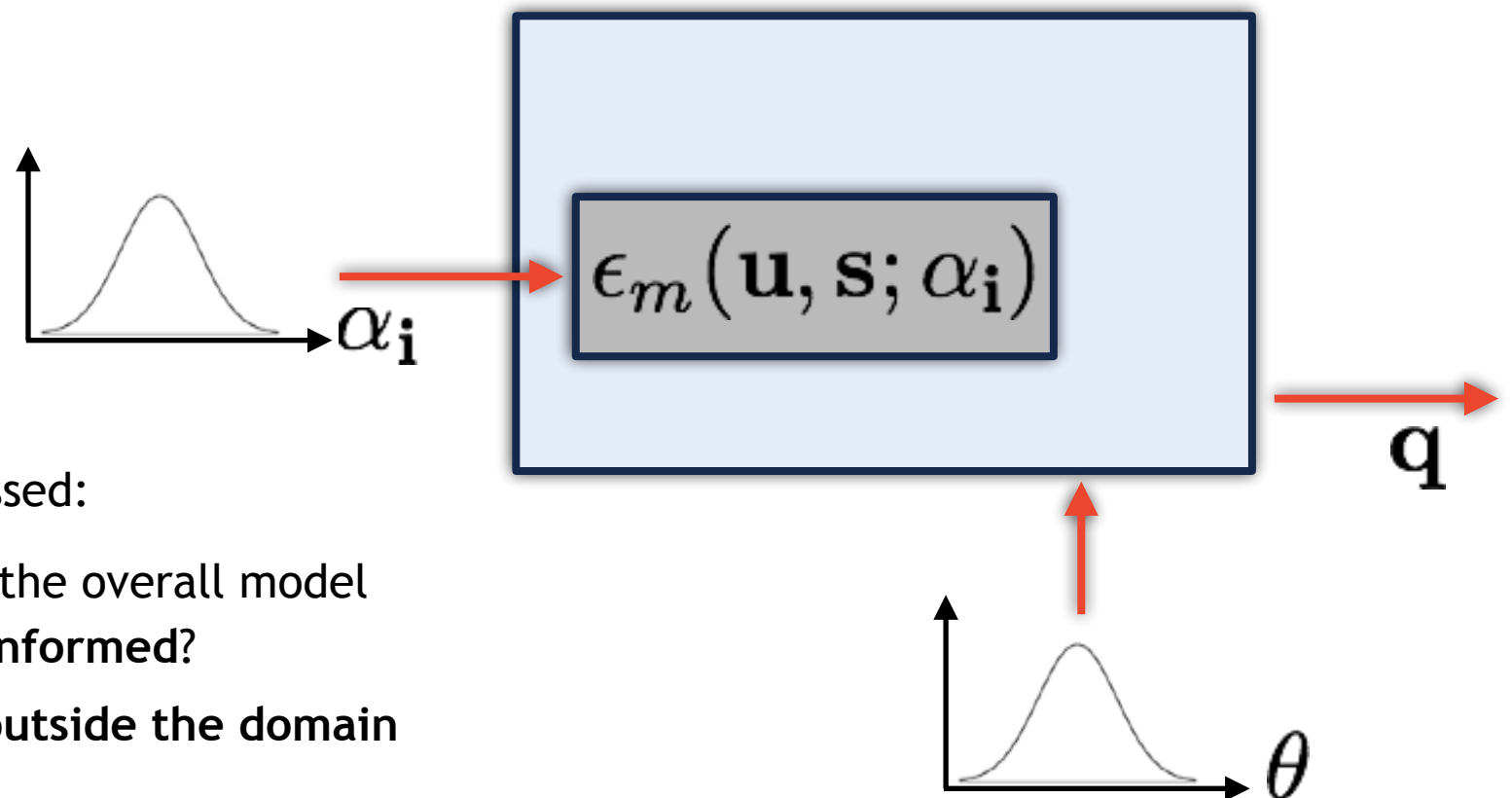


The 3-Steps Reliability Assessment

- Calibration or Inverse Problem
- Validation
- Predictive Assessment (or Estimation of the Validation Regime)

Determines whether the calibration and validation phases were sufficiently informative and challenging to provide confidence in the reliability of the predictions of the Qols.



Two primary questions need to be addressed:

- Are Qols sensitive to aspects of the overall model that have **not been effectively informed**?
- Is the overall model being used **outside the domain of applicability**?

Moreover, is the prediction is determined to be credible, does it have **sufficiently small uncertainty** for our purposes?

Why is Predictive Science Fascinating?

- **The big picture stands out (System Engineering Point of View)**

- **The black boxes must be opened (Scientific Understanding)**

Choices need to be made for:

- Priors
- Inadequacy Models
- Domains of Applicability
- Unknown Unknowns?
- When to Ask for more Data, and What to Ask
- ...

- **The curse of dimensionality is not an enemy (Recall to Efficiency)**

- Sensitivity Analysis
- Code Optimization
- Model Reduction
- ...