PROPOSAL FOR A LIFECYCLE MODEL FOR SCIENTIFIC SIMULATION SOFTWARE

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MOTIVATION

- Software lifecycle is a well researched topic in general
  - No model does justice to scientific software

- Reasons
  - Many parts under research
  - Need continuous tweaking
  - Specific process within the cycle have their own needs
  - The objectives behind the software are different
  - User community has other priorities
TARGET PHENOMENA

Mathematical Model

- Correctness, Stability, convergence
- calibration
- validation

Approximations

Discretizations

Numerical Algorithms

VALIDATION CALIBRATION
WITH FEEDBACK

Simulation analysis

planning

Code

calibration

validation

Mathematical Model 1

Approximations

Discretizations

Numerical Algorithms

Correctness, Stability convergence
COUPLED WITH SCIENCE MODULES DEVELOPMENT

Requirements

Software architecture, API design

Implement

Test

Maintain

Augment

Infrastructure

Capabilities

Model

API

Design, Develop

Validate

Integrate