1. **Motivation:**

In composite parts manufacture, **Curing Kinetics** determines:

- Max Temperature Experience
- Cycle Time
- Final Properties

2. **Modeling:**

**Diffusion Reaction System** is applied:

- **Heat Transfer:**
  \[
  \rho c \frac{\partial T}{\partial t} = k \nabla^2 T + \rho H_r \frac{\partial \alpha}{\partial t}
  \]

- **Cure Model:**
  \[
  \frac{\partial \alpha}{\partial t} = f(\alpha, T) = \left(a_1 e^{-d_1/RT} + a_2 e^{-d_2/RT} \alpha^n \right)(1-\alpha)^n
  \]
3. **OpenFoam Application:**

2-D Case, Modified LaplacianFOAM solver with an additional term for Cure Kinetics

4. **Validity and Verification:**

![Graphs showing cure degree profiles comparison based on three methods and temperature profiles comparison based on three methods.](image)