**COBRA-TF Residual Formulation Solid Liquid Coupling**

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**Abstract**

Objective: *What are you trying to do?* (0)

Motivation: *Why should I care?* (0)

Background: *What is COBRA-TF and how does it work currently?* (41)

COBRA-TF solves 8 conservation equations for liquid, entrained droplet, and vapor phases of water boiling within the rod structure of a LWR reactor core. Currently, the conservation equations analytically reduce into a pressure matrix and are solved using a semi-implicit method.

Technical Approach: *How did you accomplish your objective?* (0)

Outcomes: *What was the result? Did you meet your objective?* (0)

Further work was then applied to represent 1-D heat conduction within the heater rods. Some initial work was done to allow the code to solve either semi-implicitly, or fully implicitly.

Total: (41/300=13.66%)

**Keywords:** thermal hydraulic, residual, jacobian, solid liquid coupling, COBRA-TF, PETSC

A descriptive abstract should be placed here. Information should be provided on the research motivation, background, objective, technical approach, and outcomes. Please do not include figures and tables in the abstract. The abstract should be about 250 to 400 words. Limit the abstract to one page only.

**Keywords:** Four to five keywords here (For example: Flow regime transition, two-fluid model, turbulence, void fraction)