Making the Most out of Your 22.911 Experience

Writing your seminar abstract

Your abstract is your first chance to get your audience excited about your talk. Use one of the structures shown below to write your own. Note that Structure 2 is usually used when the audience is already familiar with your general area of research.
For more on abstracts, check out: https://mitcommlab.mit.edu/nse/commkit/abstract/

Motivating background

Problem statement or knowledge gap

One-sentence summary (often "here we show/describe/report...")

Highlight of results and what they mean

Implications ("so what?")

EXAMPLE

Structure 1 – Lead with background

Multiphysics modeling of two-phase film boiling within porous corrosion deposits

Miaomiao Jin, Michael Short

Porous corrosion deposits on nuclear fuel cladding, known as CRUD, can cause multiple operational problems in light water reactors (LWRs). CRUD can cause accelerated corrosion of the fuel cladding, increase radiation fields and hence greater exposure risk to plant workers once activated, and induce a downward axial power shift causing an imbalance in core power distribution. In order to facilitate a better understanding of CRUD's effects, such as localized high cladding surface temperatures related to accelerated corrosion rates, we describe an improved, fully-coupled, multiphysics model to simulate heat transfer, chemical reactions and transport, and two-phase fluid flow within these deposits. Our new model features a reformed assumption of 2D, two-phase film boiling within the CRUD, correcting earlier models' assumptions of single-phase coolant flow with wick boiling under high heat fluxes. This model helps to better explain observed experimental values of the effective CRUD thermal conductivity. Finally, we propose a more complete set of boiling regimes, or a more detailed mechanism, to explain recent CRUD deposition experiments by suggesting the new concept of double dryout specifically in thick porous media with boiling chimneys.

Motivating background

Problem statement or knowledge gap

"Here we show..."

Results

Implications

Source: Jin and Short. J. Comput. Phys., 316 (2016), pp. 504-518

Structure 2 – Lead with takeaway

The same abstract, rearranged to show Structure 2.

In this paper, we describe an improved, fully-coupled, multiphysics model to simulate heat transfer, chemical reactions and transport, and two-phase fluid flow within porous corrosion deposits on nuclear fuel cladding (known as CRUD). CRUD formation results in multiple operational problems in light water reactors (LWRs). These deposits can cause accelerated corrosion of the fuel cladding, increase radiation fields and hence greater exposure risk to plant workers once activated, and induce a downward axial power shift causing an imbalance in core power distribution. In order to facilitate a better understanding of CRUD's effects, such as localized high cladding surface temperatures related to accelerated corrosion rates, our new model features a reformed assumption of 2D, two-phase film boiling within the CRUD. This corrects earlier models' assumptions of single-phase coolant flow with wick boiling under high heat fluxes. The model helps to better explain observed experimental values of the effective CRUD thermal conductivity. Finally, we propose a more complete set of boiling regimes, or a more detailed mechanism, to explain recent CRUD deposition experiments by suggesting the new concept of double dryout specifically in thick porous media with boiling chimneys.

"Here we show..."

Motivating background

Problem statement or knowledge gap

Results

Implications