Modelling of non-uniform washcoat in catalytic monolith reactors

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WASHCOAT CHARACTERIZATION

- Most 1+1d models assume uniform washcoat with global properties
- SEM (Scanning Electron Microscope) to approximate global and local porosity using image
- IGA (Intelligent Gravimetric Analysis) to measure washcoat diffusivity [1]
- Input for parallel simulations to account for non-uniformity and tangential variations in properties

PARALLEL 1+1D MODEL

- Sectioning principle based on equal angle
- Assumes no tangential mass transfer (between slices)

CONCLUSIONS

- Washcoat thickness, d_wsc 92 % higher in corners
- N = 3 slices gives good tradeoff

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References: