Radiation Modelling

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Background

Fire hazards pose a serious risk to life and to property. It is important that industrial fires are carefully modelled so that the risks associated with them can be assessed and preventative action taken. DNV GL has a strong interest in such fire modelling and has developed a series of models to study them. In 2015 an MSc project at Bath University carried out an analytical investigation of radiation in the case of pool fire.

Current project

The current project proposal is intended as an extension of the previous work with particular focus on comparing different radiation approaches both in analytical and numerical aspects. Specifically it would investigate the difference between the radiation approaches currently applied across the company, with the goal of finding the "best" method. The "best" method would be one that has the best compromise between accuracy and computation time as our current Phast model currently spends a lot of time on radiation calculations.

Current radiation methods applied in different parts of DNV GL are

1. Numerical integration (ie Phast model)
2. Analytical solution for truncated cones (TRAIN model)
3. Point and disk method with analytical solution (JBURN, THORIN models)
4. Triangulated surface with analytical solution (FIRE2 model)

Beyond comparing existing radiation modelling approaches listed above, the student would be encouraged to make analytical simplifications and improvements to current numerical solution techniques as appropriate.