**Motivation & Background**

**Fluid Coking:** A thermal cracking process using hot fluidized coke to convert heavy, low-grade petroleum oils into lighter hydrocarbons.

Could local vapor saturation increase detrimental liquid carry-under to stripper?

**Research Methodology**

**Research Objectives**

1. Quantify liquid accumulation due to vapor saturation with a pilot plant Fluid Coker
2. Determine impact of vapor saturation on liquid yield and composition

**Characteristics**

- Very good mixing:
  - No agglomerates
  - Very good heat transfer
  - Liquid accumulation from vapor saturation

Measure amount of accumulated liquid vs. injection time:

- At end of injection, increase bed temperature by 30°C
- Use ΔP to measure the amount of vapor out of the bed after the end of injection

**Impact of Experimental Conditions:**

- Change of Bed Temperature (T)
- Change of Bed Pressure (P)
- Change of Injection Time (t_inj)

**Results**

- **Mass of Accumulated Liquid (g)**
  - Heating Oil
  - Varsol
  - Heating Oil / Varsol

**Conclusion**

1. New method to characterize liquid accumulation
2. Liquid accumulation mitigated by reaction to lighter compounds
3. Liquid composition

**Future Work**

1. Simulated distillation of liquid product
2. Test different feedstocks from Suncor
3. Incorporate vapor saturation in Fluid Coker model:
   - Vapor-liquid equilibrium HYSYS
   - Gas mixing and transfer measurements in large cold model of Fluid Coker

**Acknowledgement of Sponsors**