Abstract Submitted
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Estimating soot emissions from an elevated flare[1] VICTOR ALMANZA, GUSTAVO SOSA, Mexican Institute of Petroleum — Combustion aerosols are one of the major concerns in flaring operations, due to both health and environmental hazards. Preliminary results are presented for a 2D transient simulation of soot formation in a reacting jet with exit velocity of 130 m/s under a 5 m/s crossflow released from a 50 m high elevated flare and a 50 cm nozzle. Combustion dynamics was simulated with OpenFOAM. Gas-phase non-premixed combustion was modeled with the Chalmers PaSR approach and a $\kappa - \varepsilon$ turbulence model. For soot formation, Moss model was used and the ISAT algorithm for solving the chemistry. Sulfur chemistry was considered to account for the sourness of the fuel. Gas composition is 10 % H2S and 90 % C2H4. A simplified Glassman reaction mechanism was used for this purpose. Results show that soot levels are sensitive to the sulfur present in the fuel, since it was observed a slight decrease in the soot volume fraction. NSC is the current oxidation model for soot formation. Predicted temperature is high (about 2390 K), perhaps due to soot-radiation interaction is not considered yet, but a radiation model implementation is on progress, as well as an oxidation mechanism that accounts for OH radical. Flame length is about 50 m.

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