In Fluid Cokers, banks of spray nozzles are used to inject oil in a bed of hot coke particles. The purpose of this study is to determine whether interactions between spray jets could enhance liquid distribution on hot coke particles, which is crucial to improve the operability and performance of Fluid Cokers.

A low temperature experimental model of Fluid Coking was used to measure the liquid distribution. Preliminary screening of nozzle positions employed conductance measurements. A binder solution was utilized to further investigate the most interesting nozzle interactions, by simulating at low temperature the formation of agglomerates during high temperature coking. Adding different dyes to the binder solutions injected by the different nozzles helped determine how nozzles interacted.

Three types of spray nozzle interactions were investigated to determine their effect on the liquid distribution. With opposing horizontal spray nozzles, the liquid distribution can be greatly improved when their jets merge slightly, but only when the sprays are synchronized. For vertically separated spray nozzle configurations, interactions can have a detrimental or beneficial impact on liquid distribution depending on the horizontal and vertical distances between jet tips. Interactions between inclined nozzles in the same vertical plane always degrade the liquid distribution when the nozzles are spraying in the same direction, while, when they are spraying from opposite directions, the performance can be improved when the bottom jet is close enough to the top jet. A physical interpretation is provided for all the observations.