

PHOTON MONTE CARLO METHOD FOR RADIATION CALCULATIONS IN SPRAY COMBUSTION

S. P. Roy, J. Cai, and M. F. Modest[§]

School of Engg., University of California, Merced, CA, USA.

[§]Correspondence author. Email: mmodest@ucmerced.edu

ABSTRACT Accurate modeling of spray combustion requires, among other things, accurate modeling of radiative heat transfer. In this work a photon Monte Carlo based solver for radiative transfer is developed for spray combustion. The spray droplets are assumed to be cold and nonemitting. They are also assumed to be large and opaque droplets. The solver is tested in several one-dimensional configurations, where it reproduces an exact solution. Finally the solver is tested in an artificial spray jet flame to show that it can handle highly nonhomogenous media successfully.