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Analysis of Rarefied Parallel Interacting Sonic Jets WENHAI LI,
FOLUSO LADEINDE, SUNY Stony Brook — In this study, a DSMC procedure has
been developed and used to investigate rarefied parallel interacting sonic free jets.
The molecular penetration between the two jets has been studied in this paper and
a modified Penetration Knudsen Number has been introduced to evaluate the effects
of an interaction shock wave. It is shown that the existence of the interaction shock
wave produces additional effects that decrease molecular penetration and create a
displacement of molecular penetration in the jet exhaust direction. These effects can
be observed in the density profiles from the DSMC calculation. We also analyzed
the scaling law for the density profile along the symmetry axis, with the results that
the scaling law is not suitable for small values of the separation distance between
the two orifices or small values of the stagnation Knudsen number (Kn_s).

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